

## **Appendix 2-5 The Results of Whole Rock Analysis**



Appendix 2-5 The Results of Whole Rock Analysis

	G370	G378	G396	G416	G433	G442	G449	G450	I162	I173	I178	I190	I212	I232	G423
SAMPLE LOCATION	48° 46'41"N	48° 46'34"N	48° 46'54"N	48° 46'33"N	48° 45'05"N	48° 44'51"N	48° 46'12"N	48° 42'65"N	48° 47'01"N	48° 47'15"N	48° 47'19"N	48° 46'56"N	48° 46'05"N	48° 42'26"N	48° 48'24"N
	83° 05'17"E	83° 05'42"E	83° 08'21"E	83° 08'39"E	83° 01'32"E	83° 01'41"E	83° 02'18"E	83° 09'86"E	83° 06'04"E	83° 06'46"E	83° 06'21"E	83° 06'54"E	83° 02'28"E	83° 03'10"E	82° 54'47"E
LITHOLOGICAL NAME	GRANITE	GRANITE	SYENITE	GRANITE	GRANITE	GRANITE	GRANITE	SYENITE	GRANITE	GRANITE	GRANITE	SYENITE	SYENITE	GRANITE	MNZ
Magnetic Susceptibility*	0.16	0.30	0.16	0.06	0.95	0.12	0.09	0.12	0.17	0.23	0.39	0.54	0.1	0.19	0.38
SiO <sub>2</sub>	70.26	64.08	66.44	71.96	71.88	69.12	72.66	62.94	73.93	72.61	71.32	64.08	63.84	72.42	58.46
TiO <sub>2</sub>	0.25	0.36	0.22	0.20	0.240	0.37	0.14	0.61	0.26	0.25	0.21	0.37	0.34	0.24	0.99
Al <sub>2</sub> O <sub>3</sub>	14.36	16.43	16.7	13.81	13.6	14.45	12.79	17.47	13.64	13.83	14.16	16.47	15.3	13.64	17.91
Fe <sub>2</sub> O <sub>3</sub>	2.95	4.77	3.07	1.73	1.95	3.66	3.08	3.24	1.33	2.44	1.91	4.37	1.59	0.86	7.83
FeO	0.13	2.36	1.64	0.42	0.58	1.94	0.13	2.00	0.50	0.92	0.36	2.00	0.13	0.13	5.09
MnO	0.045	0.1	0.053	0.024	0.058	0.07	0.063	0.094	0.022	0.053	0.045	0.08	0.045	0.015	0.21
MgO	0.12	0.18	0.12	0.083	0.14	0.46	0.26	0.64	0.075	0.1	0.079	0.17	0.11	0.13	0.7
CaO	0.73	1.37	1.03	0.31	0.66	1.62	0.82	1.86	0.39	0.62	0.41	1.33	1.01	0.56	3.05
Na <sub>2</sub> O	4.54	5.54	5.47	4.46	4.54	4.74	3.54	5.78	4.43	4.28	4.47	5.39	3.83	4.44	5.91
K <sub>2</sub> O	5.26	6.78	5.9	5.12	5	4.92	4.42	5.7	5.3	5.21	5.29	5.56	6.02	4.98	3.11
P <sub>2</sub> O <sub>5</sub>	0.05	0.045	0.04	0.036	0.039	0.12	0.064	0.21	0.045	0.034	0.032	0.044	0.039	0.036	0.19
CO <sub>2</sub>															
H <sub>2</sub> O(+)															
H <sub>2</sub> O(-)															
LOI		0.3		0.15	0.15			0.3		0.8	0.3	0.3			1
Total	98.69	102.32	100.68	98.30	98.84	101.47	97.96	100.84	99.92	101.15	98.59	100.16	92.25	97.45	104.45
Solidification Index	0.9	0.9	0.8	0.7	1.2	3.0	2.3	3.8	0.7	0.8	0.7	1.0	1.0	1.2	3.2
SiO <sub>2</sub> /Al <sub>2</sub> O <sub>3</sub>	8.3	6.6	6.8	8.8	9.0	8.1	9.6	6.1	9.2	8.9	8.5	6.6	7.1	9.0	5.5
CaO+Na <sub>2</sub> O/K <sub>2</sub> O	1.3	1.3	1.4	1.3	1.4	1.5	1.2	1.6	1.3	1.3	1.3	1.5	1.0	1.4	2.9
K <sub>2</sub> O/Na <sub>2</sub> O+K <sub>2</sub> O	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.3
K <sub>2</sub> O/Na <sub>2</sub> O	0.8	0.8	0.7	0.8	0.7	0.7	0.8	0.6	0.8	0.8	0.8	0.7	1.0	0.7	0.3
FeO/Fe <sub>2</sub> O <sub>3</sub>	0.1	1.1	1.2	0.5	0.7	1.2	0.1	1.4	0.8	0.8	0.4	1.0	0.2	0.3	1.4
R1 (Richard et al.(1985))	1753	522	975	1951	1935	1615	2464	655	2057	2004	1862	879	1432	2051	705
R2 (Richard et al.(1985))	366	478	444	308	344	480	352	573	313	343	326	474	414	334	712
Modal opaque minerals	0.4	0.7	0.3	0.5	0.7	1.0	0.5	1.5	0.7	1.0	0.5	0.5	0.5	0.3	3.0



## **Appendix 2-6 The Results of Minor Element Analysis**



Appendix 2-6 The Results of Minor Element Analysis

SAMPLE NUMBER	G370	G378	G396	G416	G433	G442	G449	G450	I162	I173	I178	I190	I212	I232	G423
SAMPLE LOCATION	48° 46'41"N	48° 46'34"N	48° 46'54"N	48° 46'33"N	48° 45'05"N	48° 44'51"N	48° 46'12"N	48° 42'65"N	48° 47'01"N	48° 47'15"N	48° 47'19"N	48° 46'56"N	48° 46'05"N	48° 42'26"N	48° 48'24"N
	83° 05'17"E	83° 05'42"E	83° 08'21"E	83° 08'39"E	83° 01'32"E	83° 01'41"E	83° 02'18"E	83° 09'86"E	83° 06'04"E	83° 06'46"E	83° 06'21"E	83° 06'54"E	83° 02'28"E	83° 03'10"E	82° 54'47"E
LITHOLOGICAL NAME	GRANITE	GRANITE	SYENITE	GRANITE	GRANITE	GRANITE	GRANITE	SYENITE	GRANITE	GRANITE	GRANITE	SYENITE	SYENITE	GRANITE	MNZ
Magnetic Susceptibility*	0.46	1.69	35.5	4.67	0.1	0.2	11	0.09	3.66	3.57	2.38	6.32	0.4	4.86	1.98
Ag(ppm)	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Ba(ppm)	148.5	97.7	84.8	46.3	223	365	185	867	92.9	66.1	66.6	82.8	54.5	333	8180
Ce(ppm)	204	85.2	38.6	126.5	145	118	99.7	61.6	135.5	207	144.5	59.5	81.4	131	45.1
Co(ppm)	1	1.1	1.2	1.5	1.2	3.8	2.6	4.9	0.9	0.9	0.9	1.2	0.8	2.2	4
Cr(ppm)	30	30	40	80	40	120	110	20	20	20	20	20	30	20	20
Cs(ppm)	1.1	1	1.5	1	2.1	2	3.6	1.2	1.6	0.7	0.8	1.8	1.2	1.2	0.7
Cu(ppm)	10	12	8	107	24	73	154	13	10	13	19	18	15	13	18
Dy(ppm)	6.4	7.3	4.5	6.8	10.2	8.8	10.1	5.4	4.7	7.7	5.3	6.6	4.9	9	4.1
Er(ppm)	3.6	4.3	2.9	3.8	5.8	5.4	7.6	3.3	2.5	4.2	2.9	4	2.8	4.4	2.3
Eu(ppm)	0.4	0.3	0.3	0.2	0.50	0.8	0.4	2.1	0.2	0.2	0.2	0.2	0.2	1.4	6.3
Ga(ppm)	28	29	28	27	31	28	31	24	27	27	27	28	28	27	22
Gd(ppm)	10.1	8.4	4.7	9.9	11.6	10	9	6.2	7.9	12.5	8.5	7.2	7.5	12.2	5.2
Hf(ppm)	13	31	25	12	14	12	12	14	14	15	14	29	29	9	4
Ho(ppm)	1.3	1.5	1	1.4	2	1.9	2.3	1.1	0.9	1.5	1	1.4	1	1.7	0.8
La(ppm)	96.2	35.4	19.1	75	66.5	53.4	44.8	28.4	60.4	102	62.3	23.6	49.8	52.8	19.9
Lu(ppm)	0.6	0.8	0.5	0.6	0.8	0.8	1.2	0.5	0.4	0.7	0.5	0.8	0.5	0.5	0.4
Mo(ppm)	1	2	3	2	1	11	3	2	1	2	1	1	1	1	1
Nb(ppm)	16	19	15	15	25	21	23	14	18	18	15	24	21	15	15
Nd(ppm)	79.4	46.3	23.1	66.9	64.1	53.2	42.7	31.6	58.3	92.1	57.9	33.6	52.5	61.9	25.1
Ni(ppm)	6	6	19	14	7	51	17	7	7	7	7	7	7	9	5
Pb(ppm)	69	107	39	269	221	407	822	102	42	60	121	97	121	95	95
Pr(ppm)	22.7	11.3	5.7	17.5	17.3	14.2	11.7	7.8	16	25.1	15.8	7.8	13.8	15.5	5.8
Rb(ppm)	82.1	56.1	75.8	72.8	128	105	173.5	52.1	81.4	72.2	72.2	70	86.4	78.2	28.3
Sm(ppm)	11.8	9.6	5.1	11.2	12.4	10.5	8.7	6.5	9.7	14.6	9.5	7.8	9.5	13.1	5.5
Sn(ppm)	4.0	4.0	4.0	17.0	9.0	10.0	30.0	4.0	3.0	3.0	3.0	4.0	4.0	5.0	3.0
Sr(ppm)	32.7	35.1	21.9	12.1	53.5	132	52.8	244	24.7	16.1	15.5	24	21.1	108.5	344
Ta(ppm)	0.8	0.8	0.7	0.7	1.5	1.3	1.7	0.7	0.8	0.7	0.6	1.0	0.9	0.8	0.8
Tb(ppm)	1.3	1.3	0.8	1.4	1.9	1.6	1.6	1	1	1.6	1.1	1.2	1	1.8	0.8
Th(ppm)	7	4	2	5	10	9	23	3	7	7	6	4	5	5	2
Tl(ppm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Tm(ppm)	0.5	0.6	0.25	0.5	0.8	0.8	1.2	0.5	0.25	0.6	0.25	0.6	0.25	0.6	0.25
U(ppm)	1.0	2.0	0.8	1.0	2.7	2.4	5.3	1.2	1.0	1.0	1.1	1.3	1.6	2.3	0.7
V(ppm)	15	12	15	11	12	26	12	32	16	13	12	16	16	19	92
W(ppm)	2	2	2	3	3	4	4	3	2	3	2	3	3	3	2
Y(ppm)	31.6	36.3	24.2	34.3	54.9	50.3	68.7	28.5	20.5	33.9	22.6	34.3	22.6	37.7	21.2
Yb(ppm)	3.5	4.7	3.3	3.4	5.2	5.1	8.1	3	2.2	3.9	2.9	4.4	2.8	3.7	2.2
Zn(ppm)	386	562	198	1310	1125	1125	2880	351	202	292	542	462	711	416	439
Zr(ppm)	554	1355	1050	526	468	413	260	636	599	657	609	1245	1260	332	167.5
Y+Nb(ppm)	47.6	55.3	39.2	49.3	79.9	71.3	91.7	42.5	38.5	51.9	37.6	58.3	43.6	52.7	36.2
Yb+Ta(ppm)	4.3	5.5	4.0	4.1	6.7	6.4	9.8	3.7	3.0	4.6	3.5	5.4	3.7	4.5	3.0



**Appendix 2-7 The Results of CIPW Normative Constituent**



Appendix 2-7 The Results of CIPW Normative Constituents

SAMPLE NUMBER	G370	G378	G396	G416	G433	G442	G449	G450	I162	I173	I178	I190	I212	I232	G423
SAMPLE LOCATION	48° 46'41"N	48° 46'34"N	48° 46'54"N	48° 46'33"N	48° 45'05"N	48° 44'51"N	48° 46'12"N	48° 42'65"N	48° 47'01"N	48° 47'15"N	48° 47'19"N	48° 46'56"N	48° 46'05"N	48° 42'26"N	48° 48'24"N
	83° 05'17"E	83° 05'42"E	83° 08'21"E	83° 08'39"E	83° 01'32"E	83° 01'41"E	83° 02'18"E	83° 09'86"E	83° 06'04"E	83° 06'46"E	83° 06'21"E	83° 06'54"E	83° 02'28"E	83° 03'10"E	82° 54'47"E
LITHOLOGICAL NAME	GRANITE	GRANITE	SYENITE	GRANITE	GRANITE	GRANITE	GRANITE	SYENITE	GRANITE	GRANITE	GRANITE	SYENITE	SYENITE	GRANITE	MNZ
qz	22.12	4.25	9.94	25.73	25.05	19.66	33.19	3.72	27.06	26.39	24.17	8.90	16.30	26.24	4.55
or	31.09	40.07	34.87	30.26	29.55	29.08	26.12	33.69	31.32	30.79	31.26	32.86	35.58	29.43	18.38
ab	38.42	46.77	46.29	37.74	38.42	40.11	29.95	48.91	37.49	36.22	37.82	45.61	32.41	37.57	50.01
an	3.27	0.00	3.59	1.30	1.96	3.62	3.65	4.89	1.64	2.85	1.83	4.33	4.76	2.54	13.16
lc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ne	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
kal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C	0.00	0.00	0.00	0.45	0.00	0.00	0.84	0.00	0.01	0.10	0.41	0.00	0.74	0.01	0.00
di	0.00	0.99	1.03	0.00	0.75	2.58	0.00	2.33	0.00	0.00	0.00	0.91	0.00	0.00	0.60
hy	0.30	0.00	0.01	0.21	0.00	0.00	0.65	0.66	0.19	0.25	0.20	0.00	0.27	0.32	3.08
wo	0.00	2.19	0.00	0.00	0.04	0.14	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00
ol	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ac	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
mt	0.00	6.87	4.45	0.85	1.36	5.31	0.20	4.70	0.93	2.41	0.70	5.63	0.00	0.00	11.35
il	0.36	0.68	0.42	0.38	0.46	0.70	0.27	1.16	0.49	0.47	0.40	0.70	0.36	0.30	1.88
hm	0.02	0.00	0.00	1.14	1.01	0.00	2.94	0.00	0.69	0.78	1.43	0.48	1.59	0.86	0.00
ti	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ap	0.12	0.10	0.09	0.08	0.09	0.28	0.15	0.49	0.10	0.08	0.07	0.10	0.09	0.08	0.44
ru	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.08	0.00
Total	95.77	102.02	100.69	98.14	98.69	101.48	97.96	100.55	99.92	100.34	98.29	99.86	92.25	97.43	103.45
mt+il+hm	0.38	7.55	4.87	2.37	2.83	6.01	3.41	5.86	2.11	3.66	2.53	6.81	1.95	1.16	13.23
Differentiation Index	95.7	89.3	90.5	95.5	94.3	87.6	91.1	85.8	95.9	93.1	94.9	87.5	91.4	95.7	70.5
(an/an+ab) × 100	7.8	0.0	7.2	3.3	4.9	8.3	10.9	9.1	4.2	7.3	4.6	8.7	12.8	6.3	20.8
Modal opaque minerals	0.4	0.7	0.3	0.5	0.7	1.0	0.5	1.5	0.7	1.0	0.5	0.5	0.5	0.3	3.0



## **Appendix 2-8 Photomicrographs of EPMA**

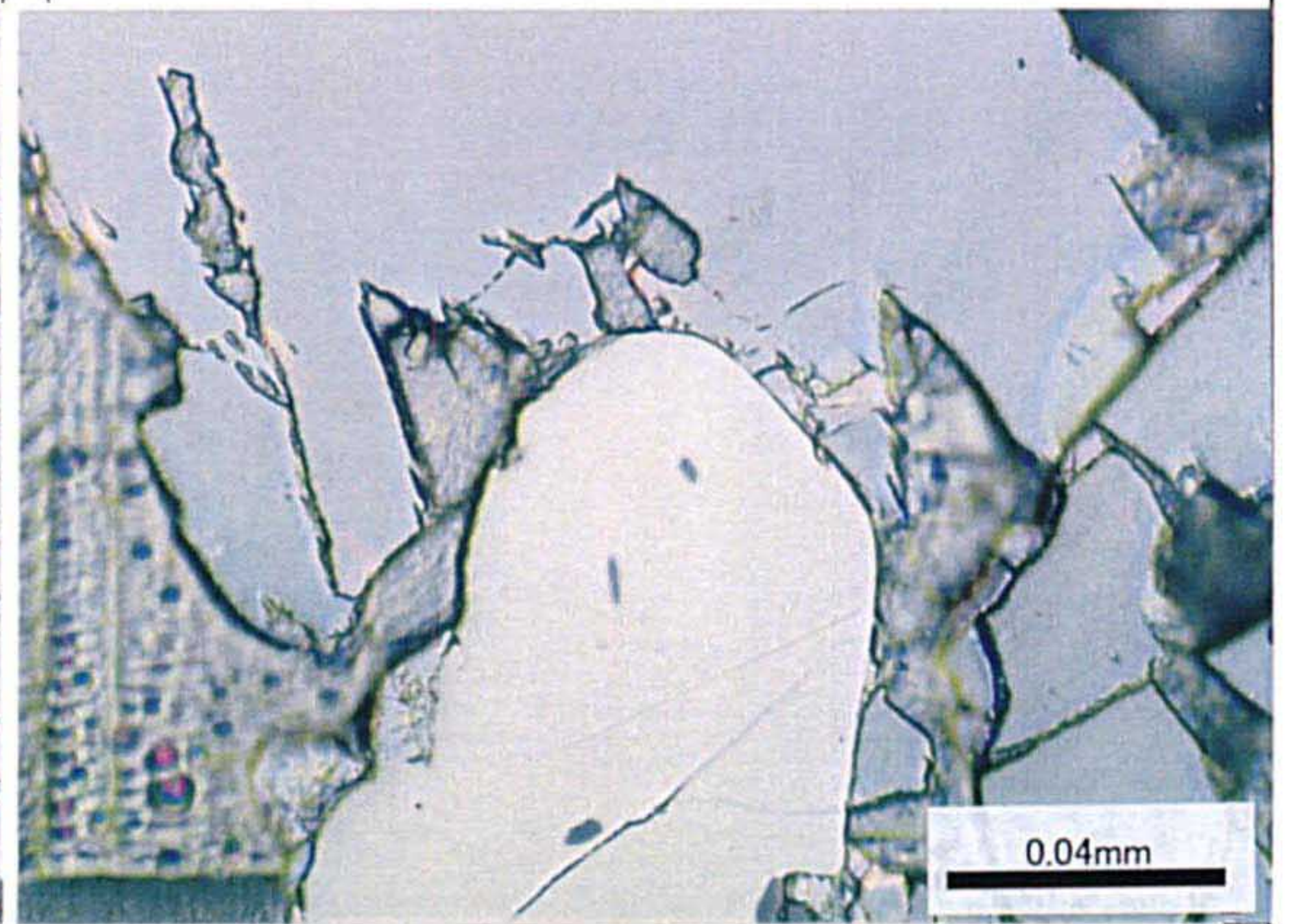
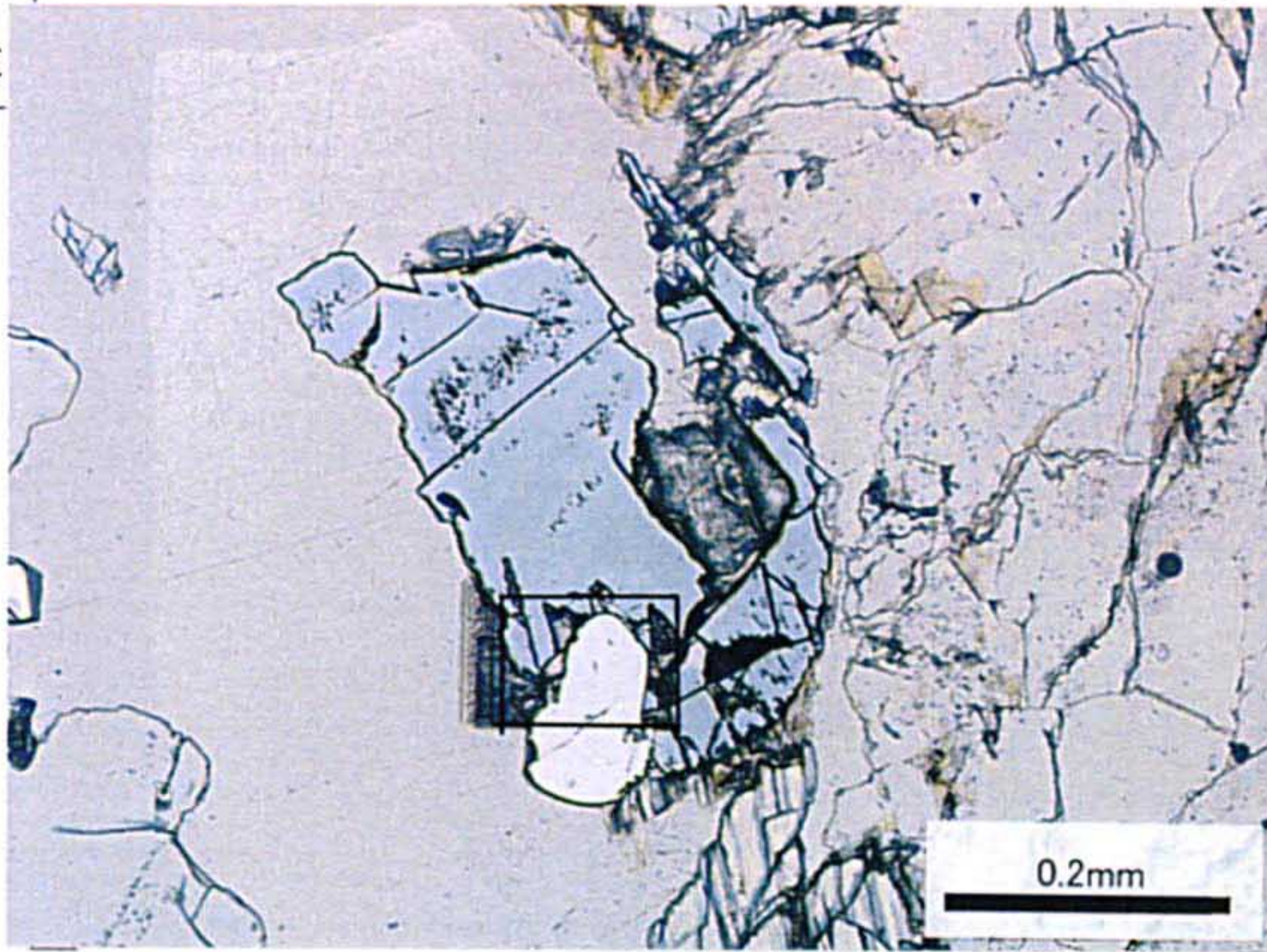


# EPMA試験結果

Magnetite・Hematite  
from G 378

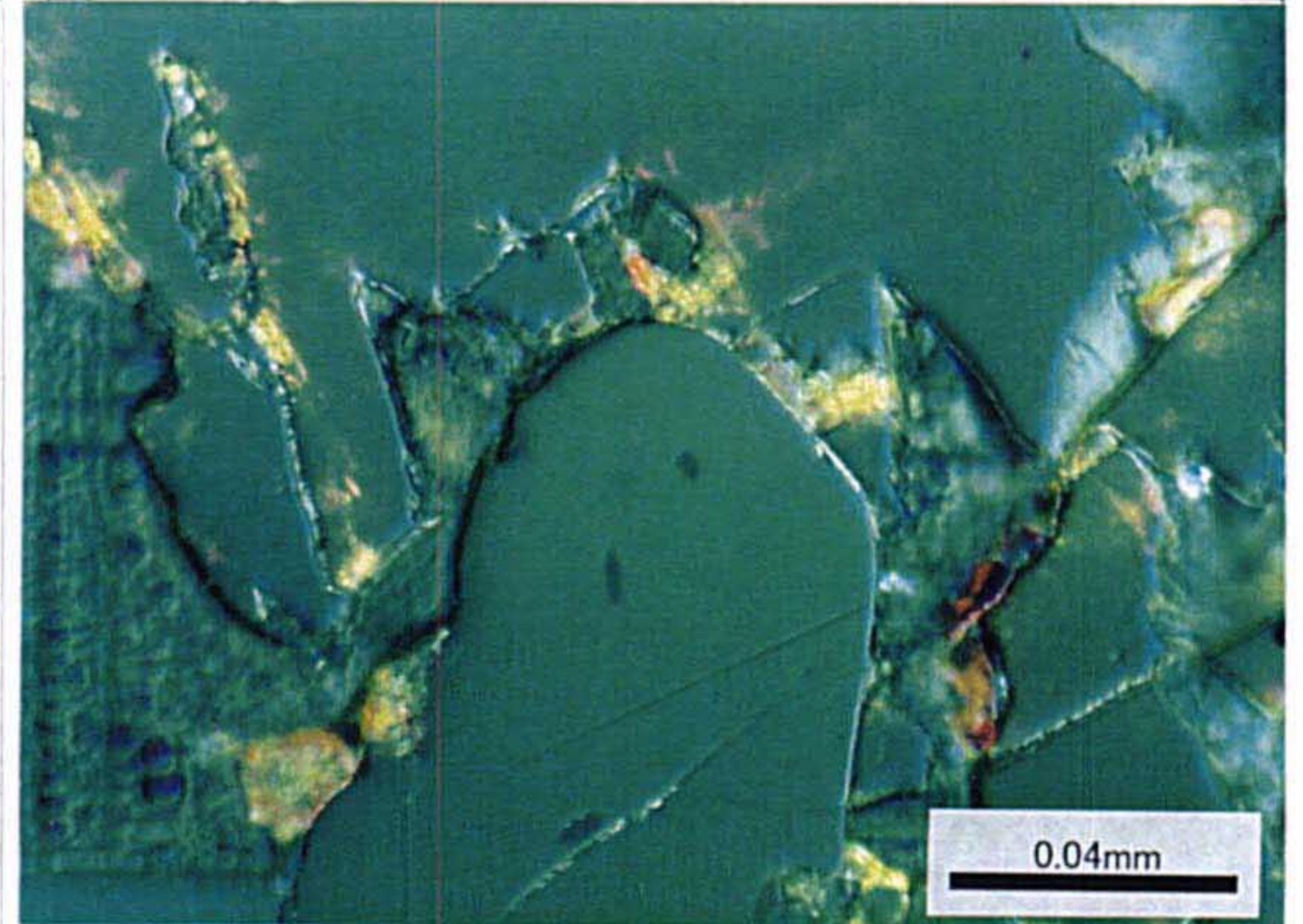
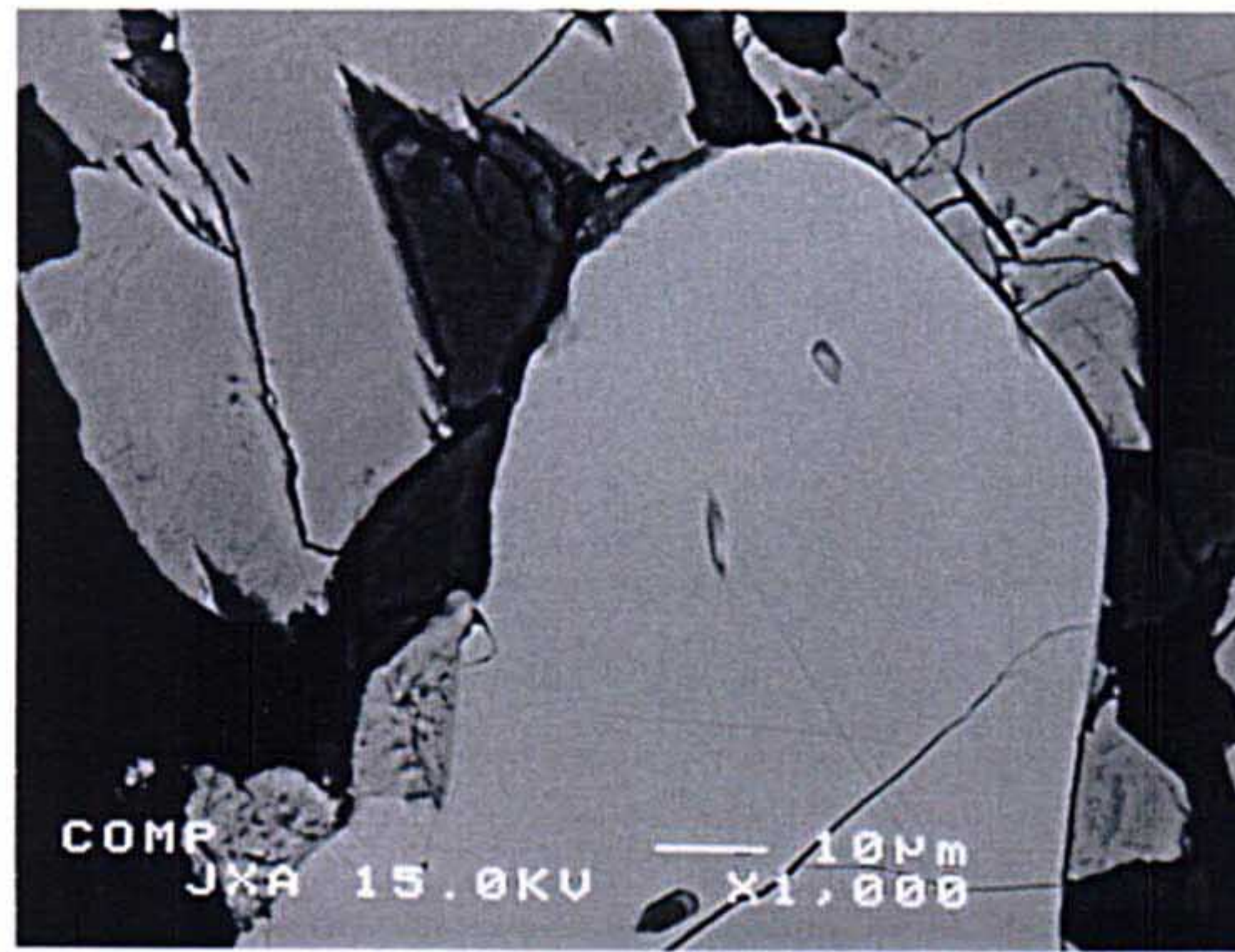
受付番号	1
試料名	
加速電圧	15 KV
電子線電流	0.05 $\mu$ A
倍率	$\times 1000$
測定年月日	

備考:



\*撮影フィルム控

Polished section Reflected light	Polished section Reflected light
組成像	Polished section Reflected light crossed nicols



MITSUI KINZOKU  
CORPORATE R & D CENTER

備考:



\*撮影フィルム控

Ti	Fe
Mn	O



EPL-1

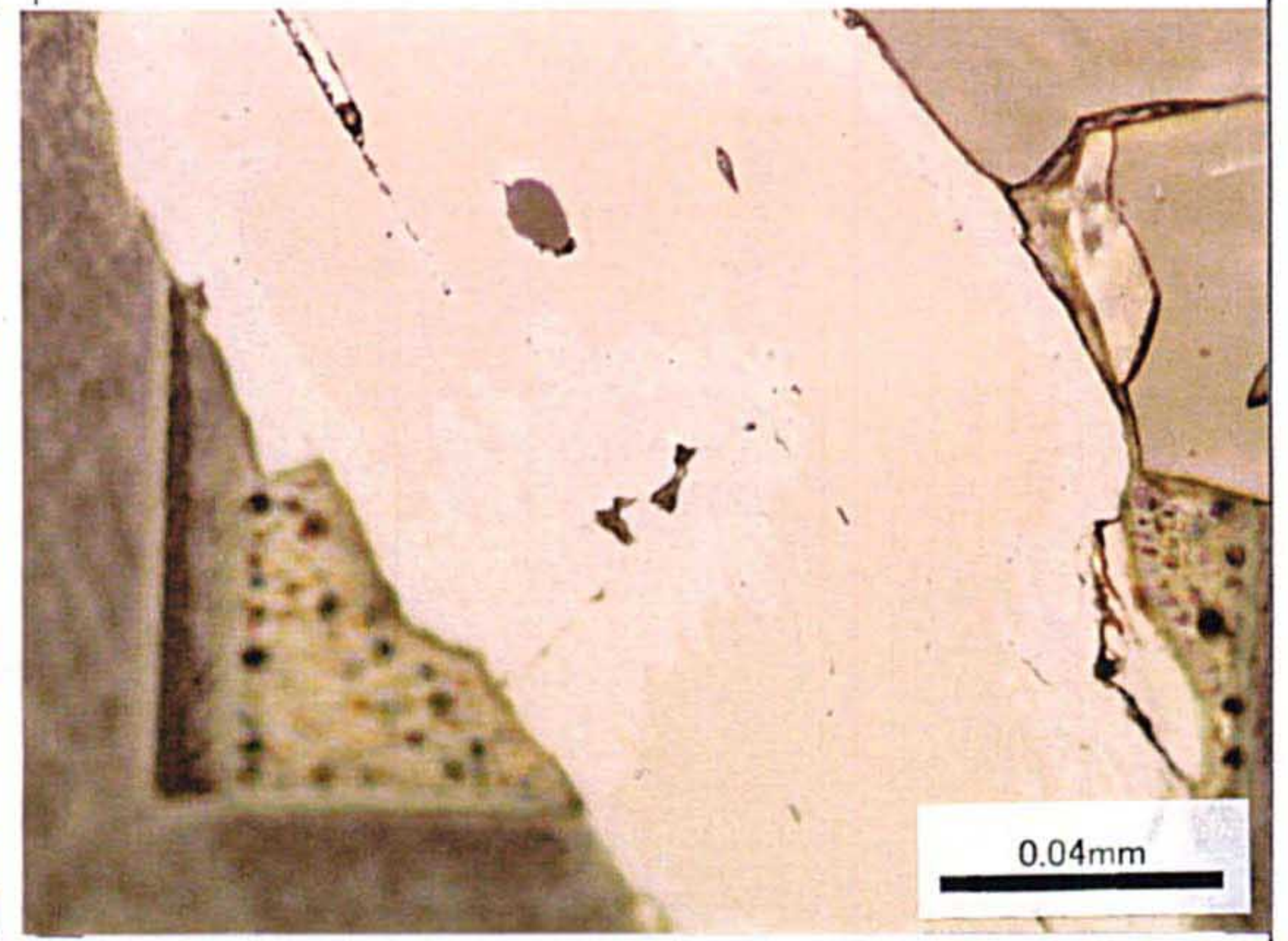
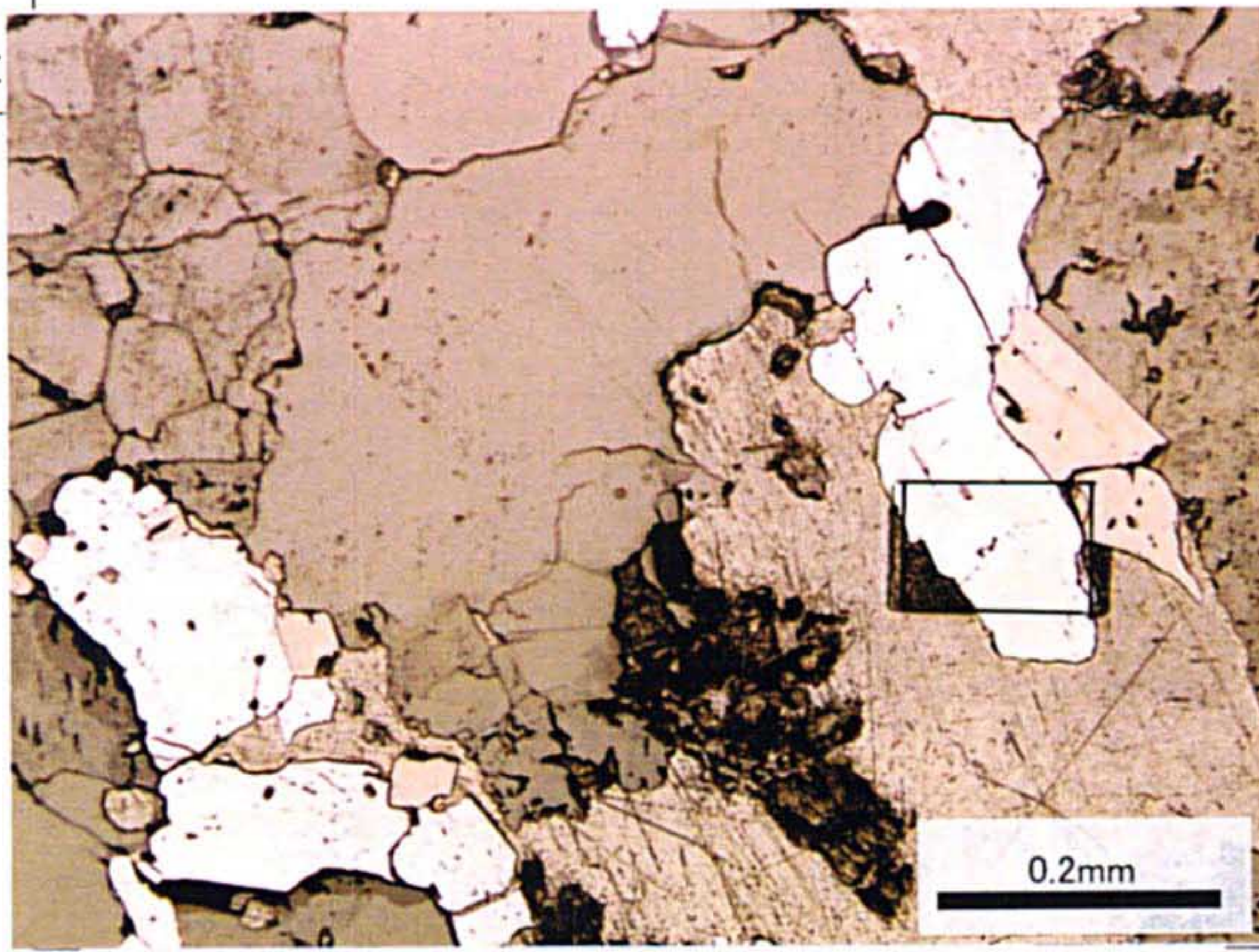


# EPMA試験結果

Ilmenite/Pseudorutile  
from I 232

受付番号	2
試料名	
加速電圧	15 KV
電子線電流	0.05 $\mu$ A
倍率	$\times 1000$
測定年月日	

備考:

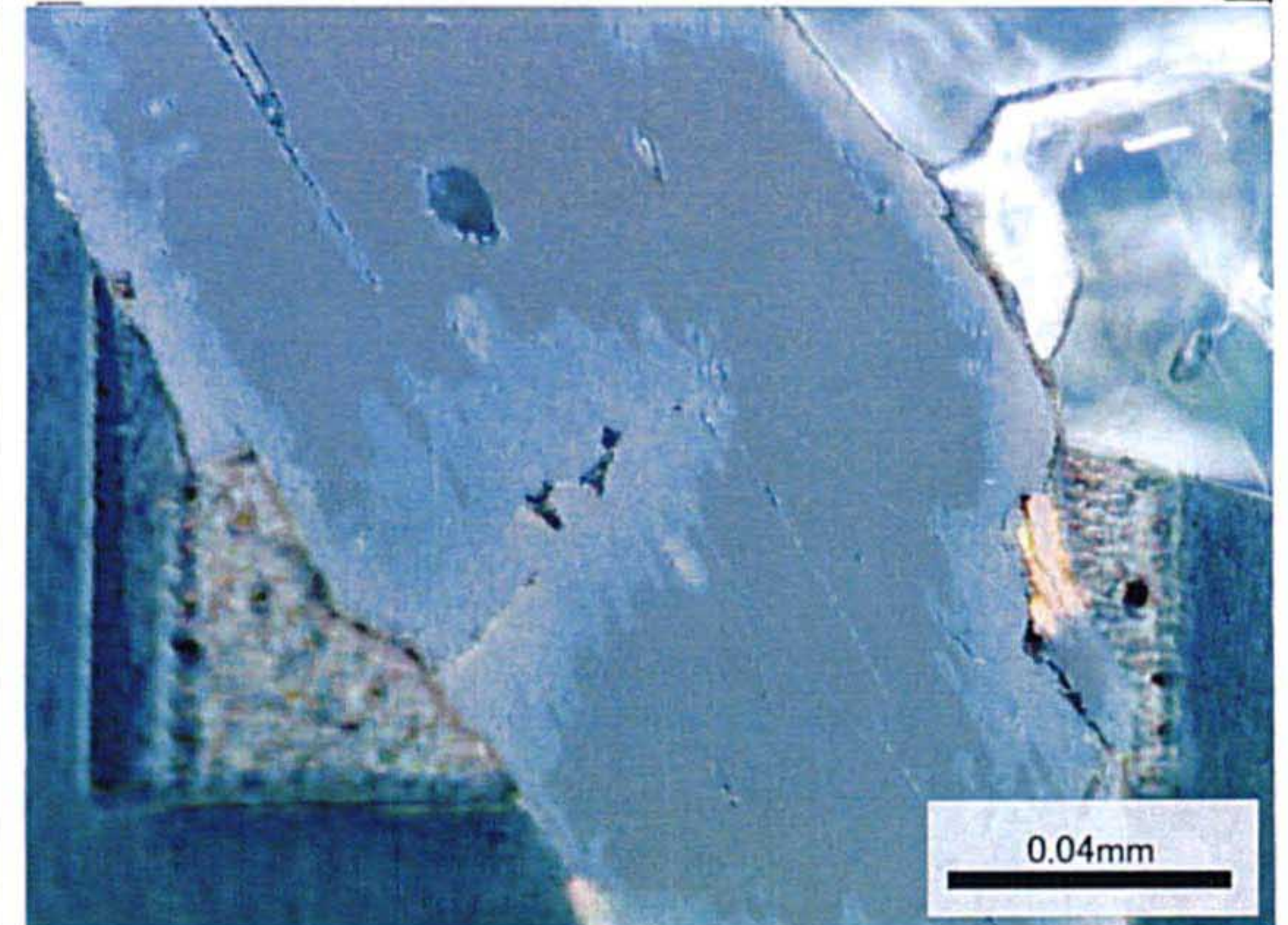
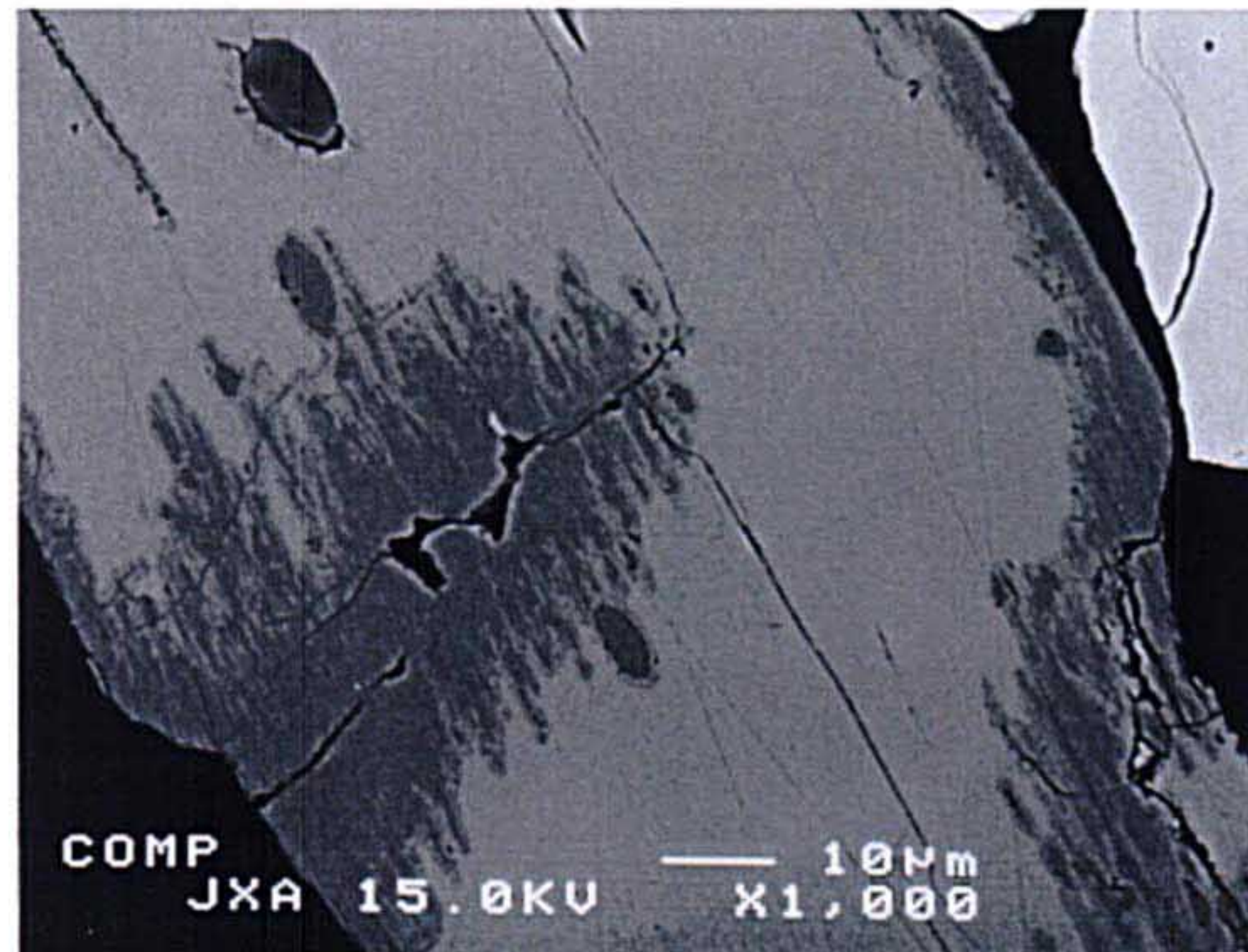


\*撮影フィルム控

Polished section  
Reflected light

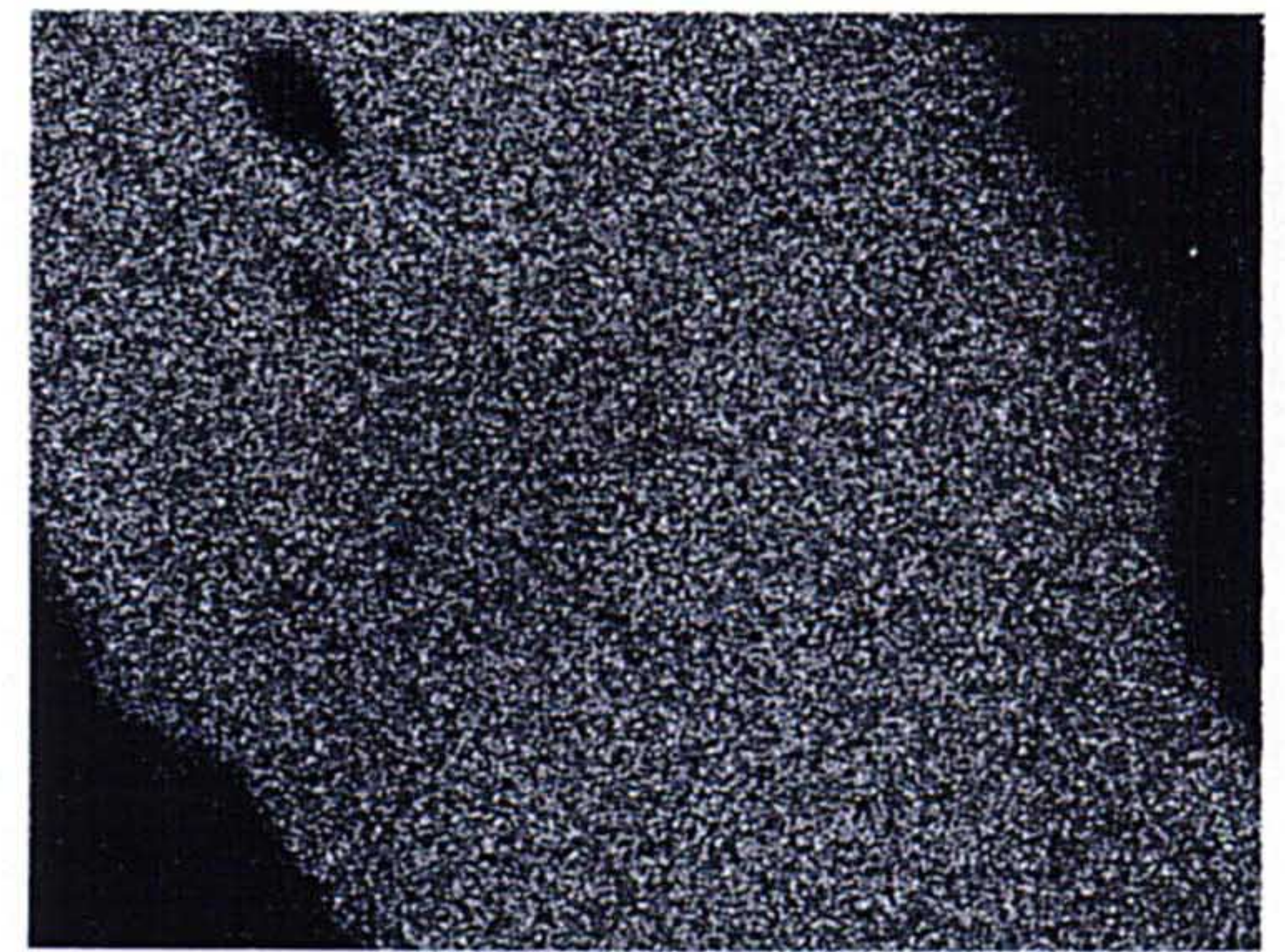
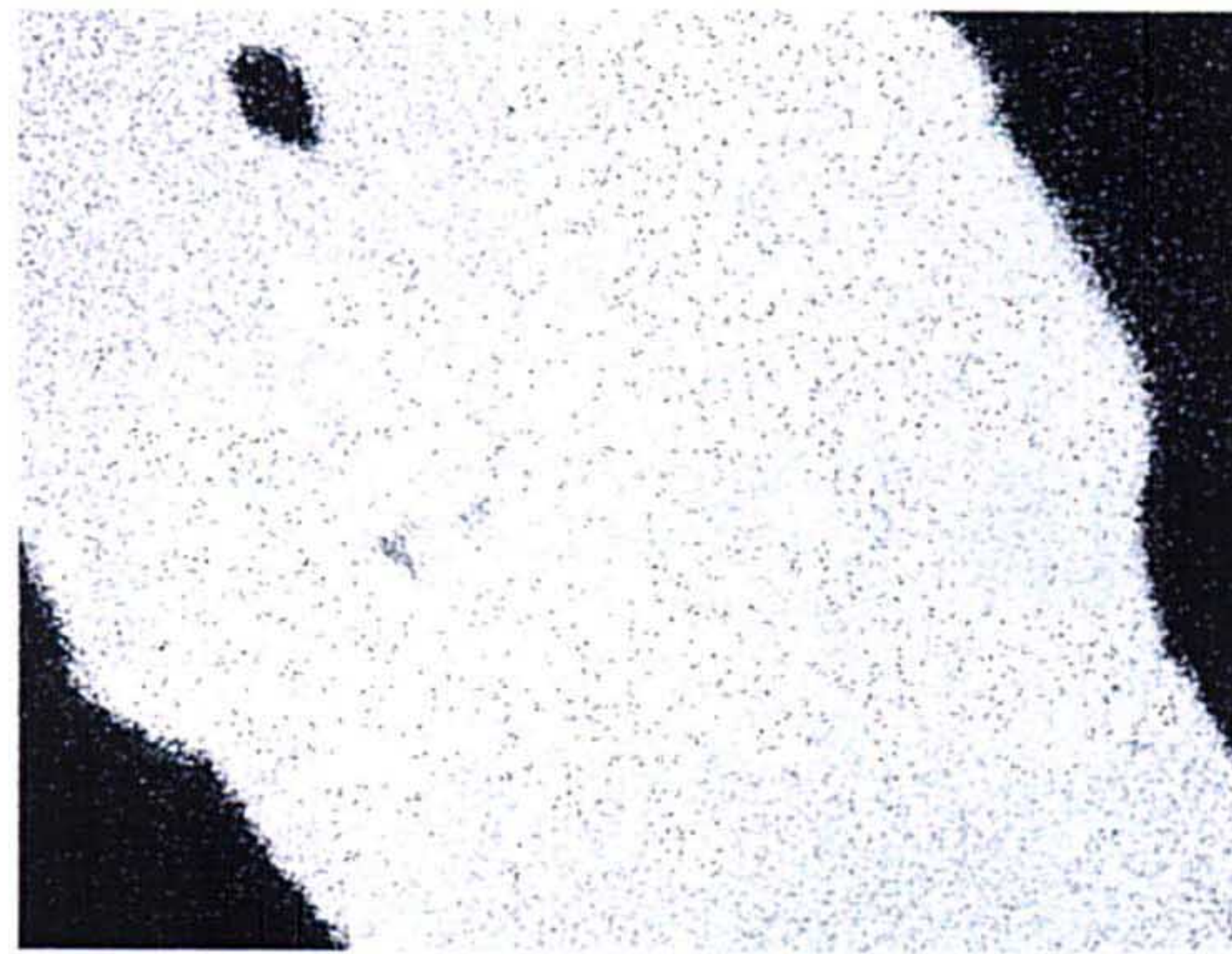
組成像

Polished section  
Reflected light  
crossed nicols



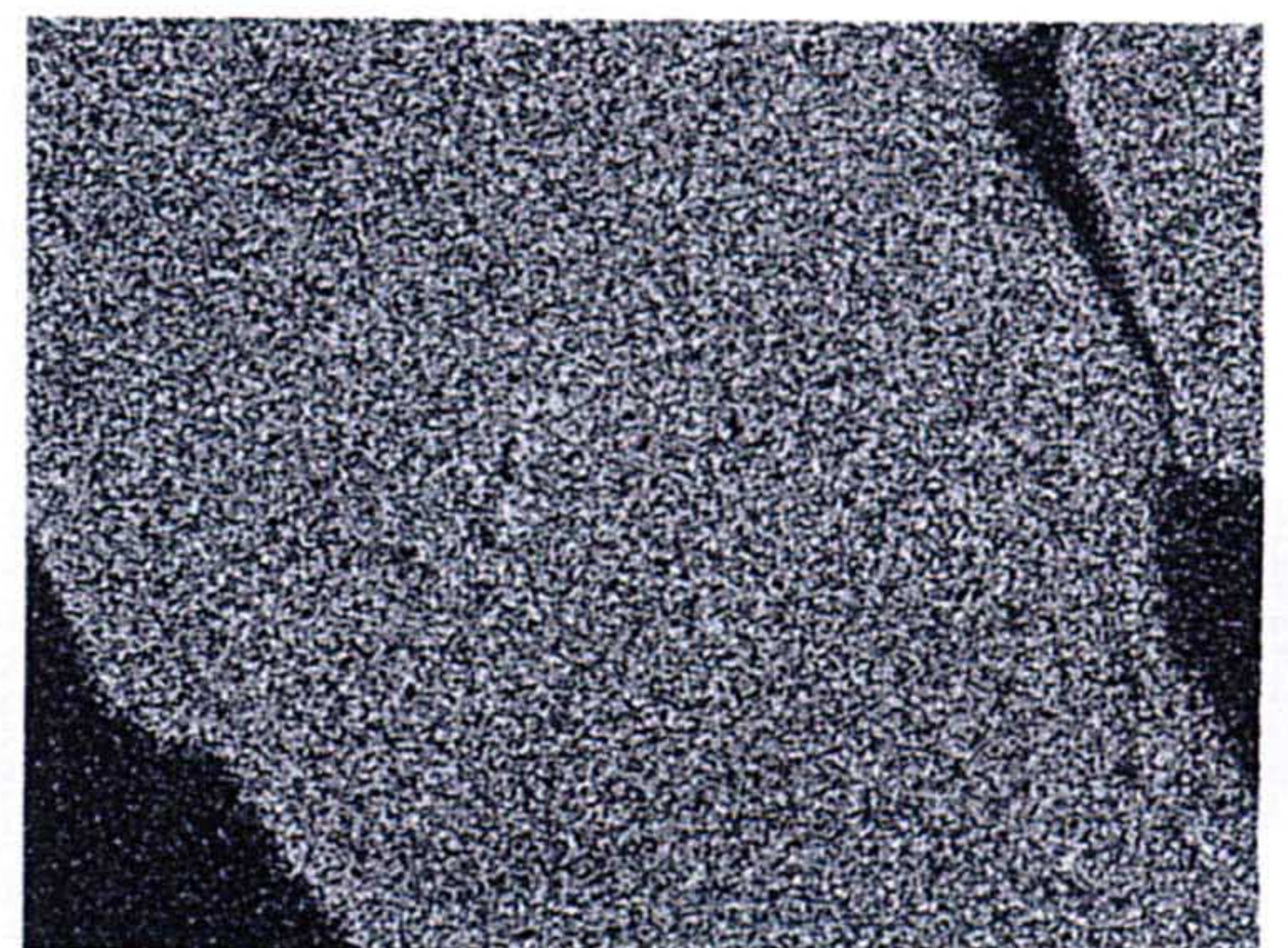
**MITSUI KINZOKU**  
CORPORATE R & D CENTER

備考:



\*撮影フィルム控

Ti	Fe
Mn	O



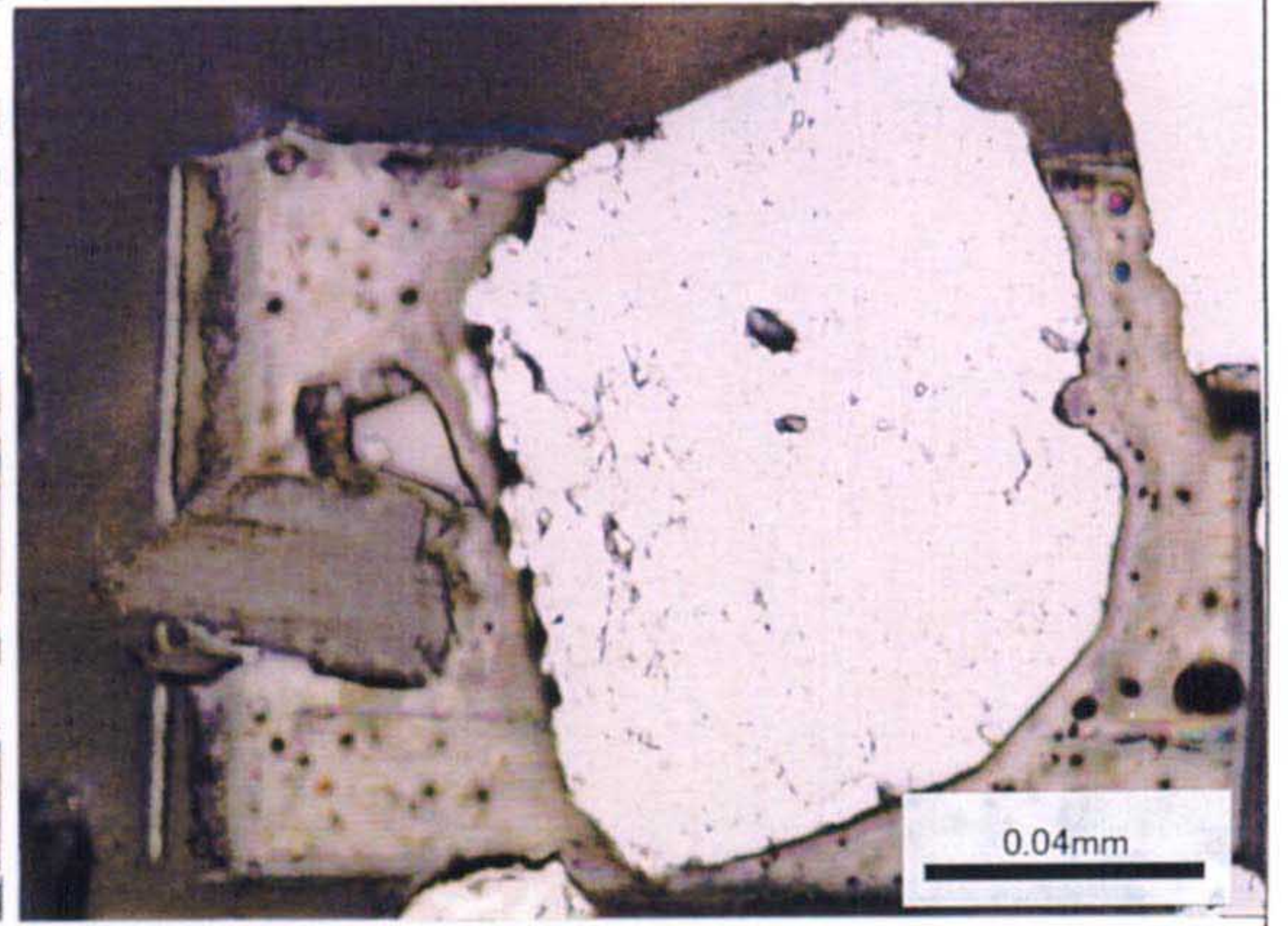
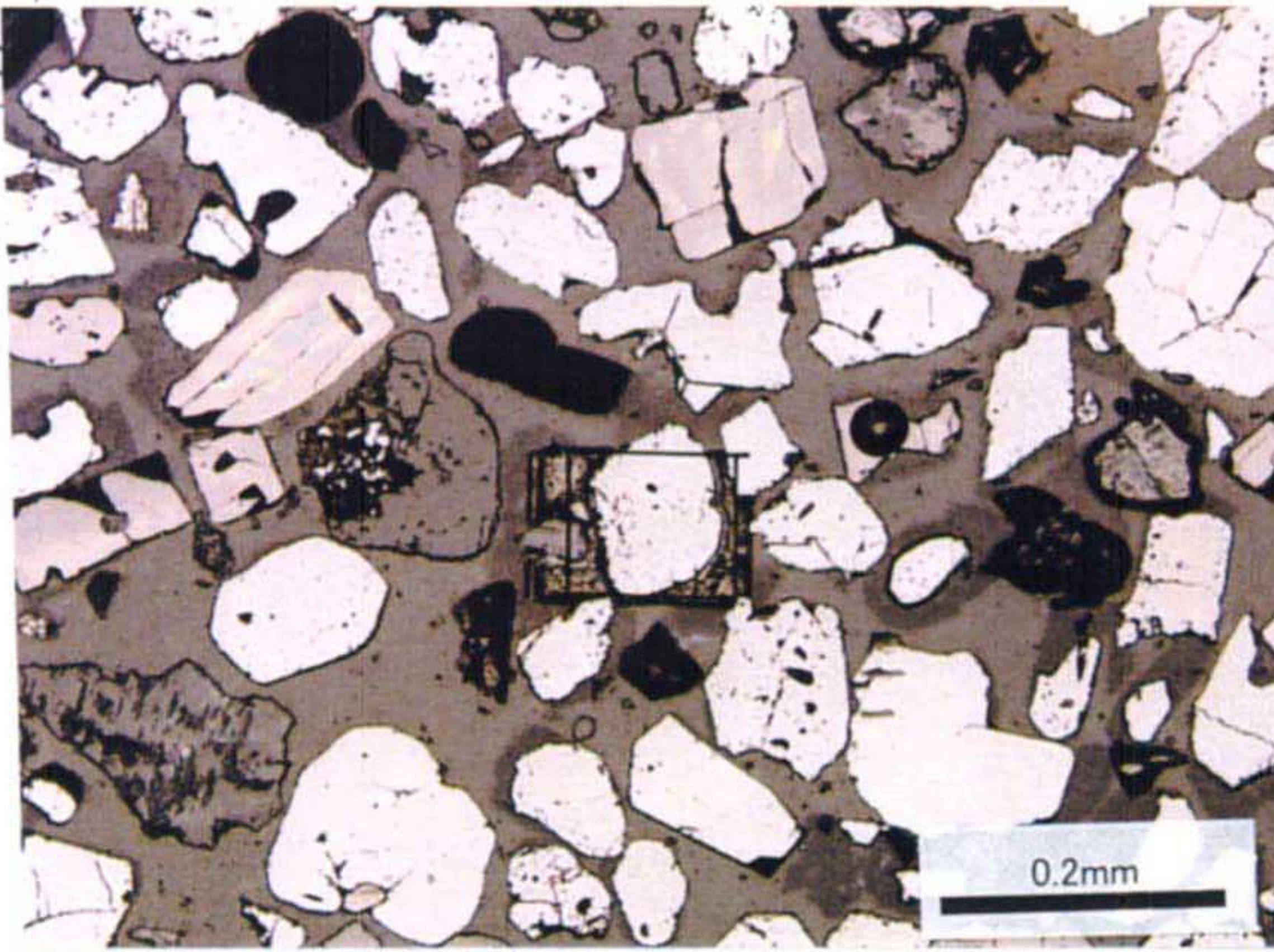


# EPMA試験結果

Pseudorutile  
from karaotkel Pit2

受付番号	3
試料名	
加速電圧	15 KV
電子線電流	0.05 $\mu$ A
倍率	$\times 1000$
測定年月日	

備考:



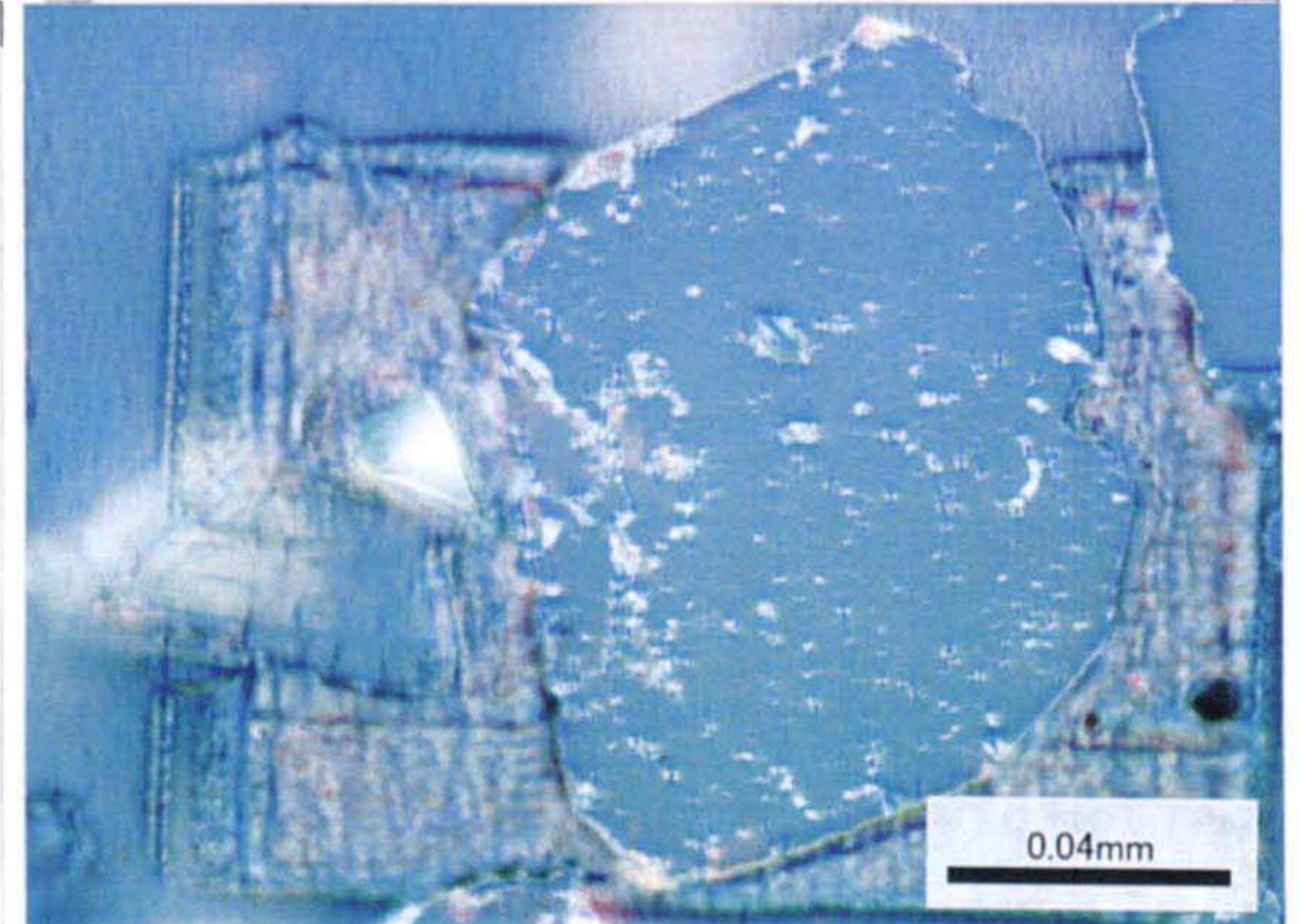
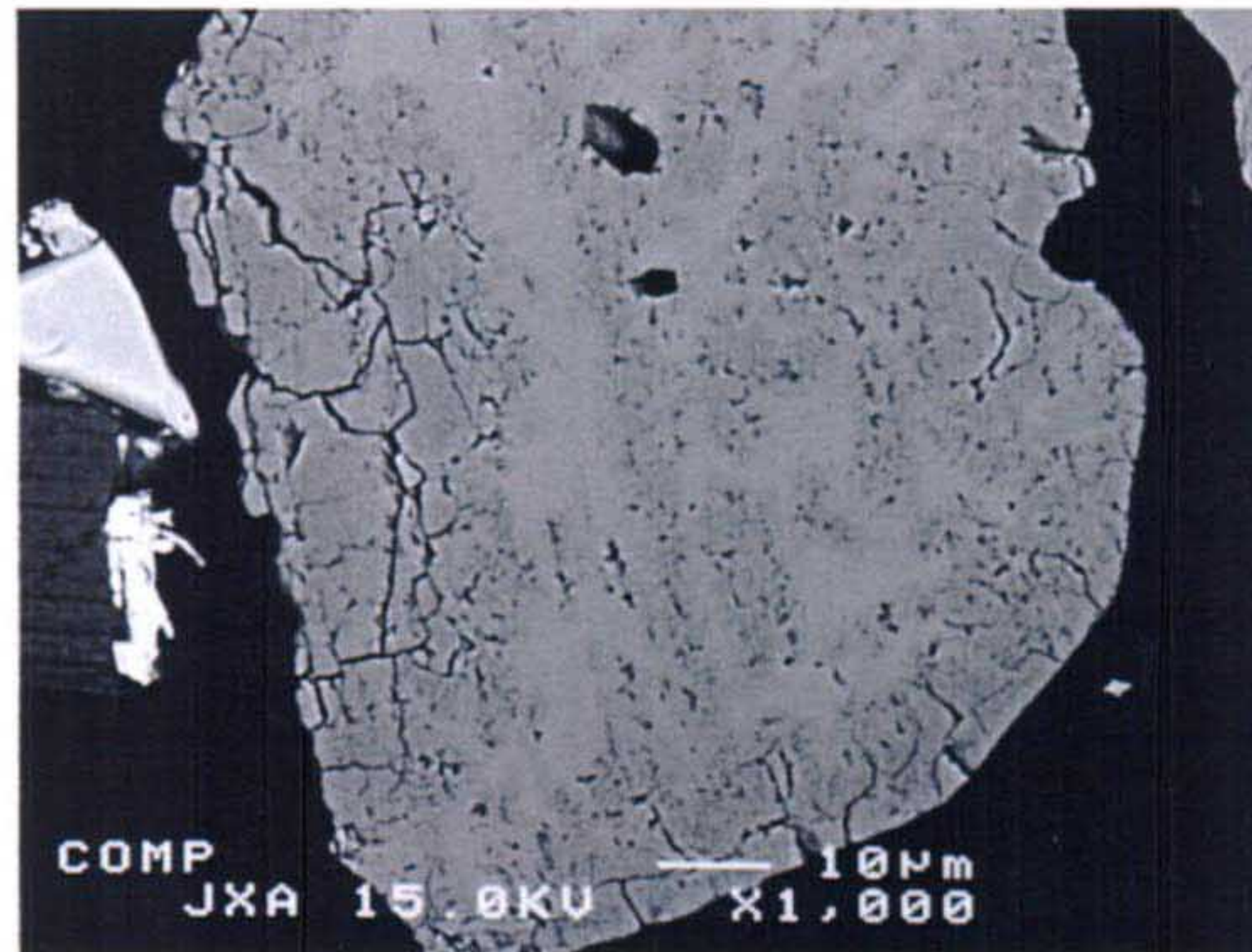
\*撮影フィルム控

Polished section  
Reflected light

Polished section  
Reflected light

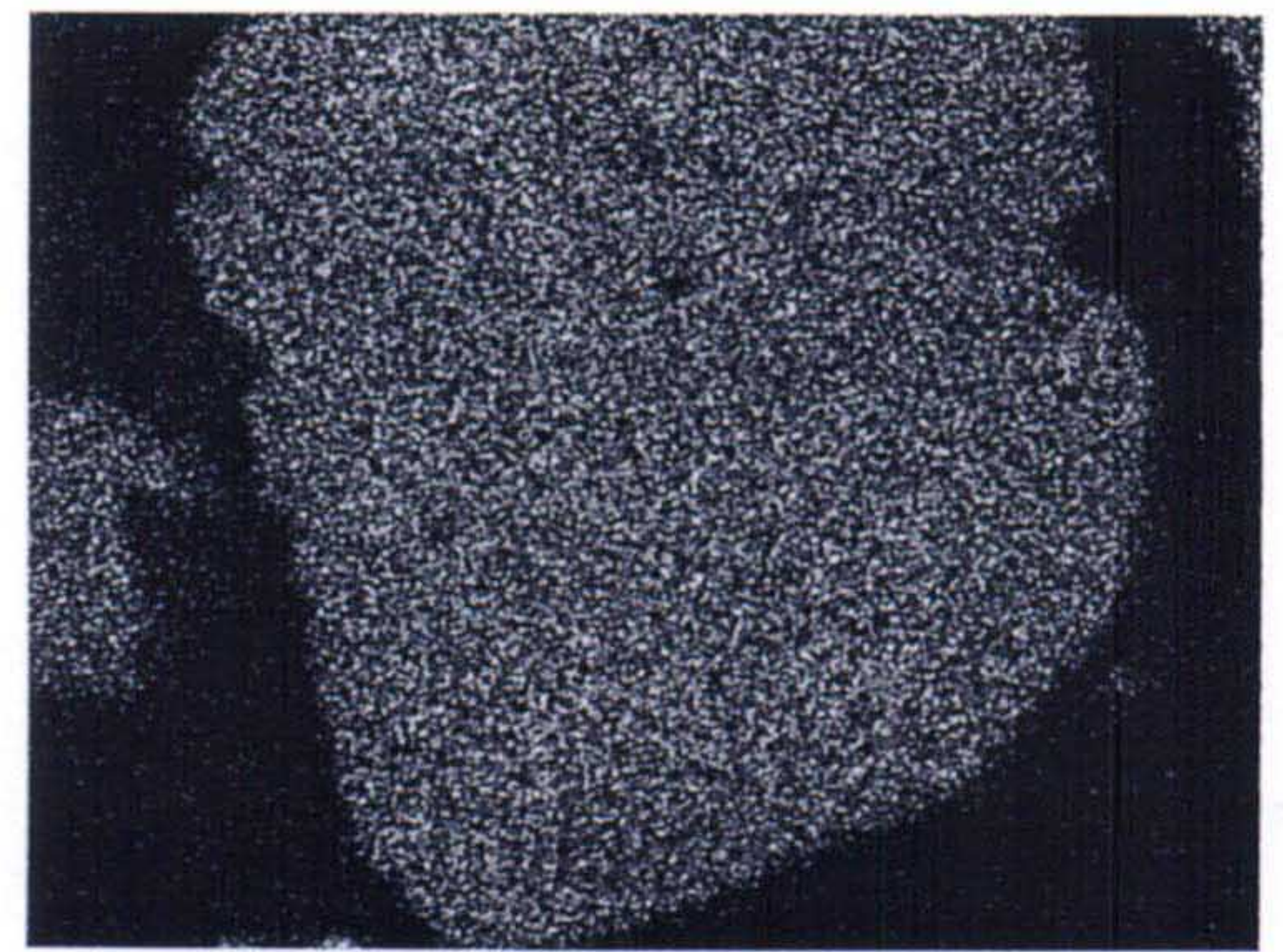
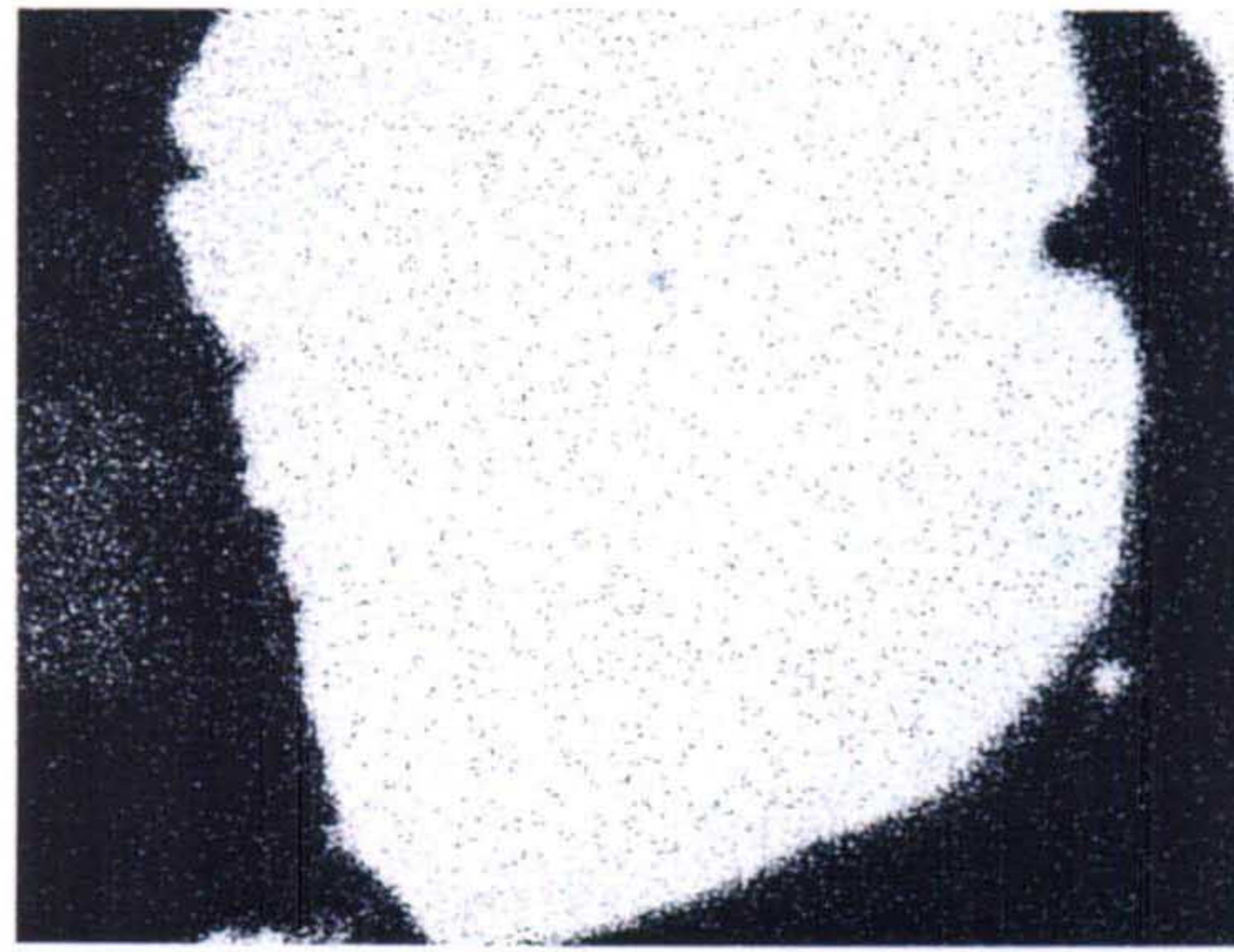
組成像

Polished section  
Reflected light  
crossed nicols



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備考:



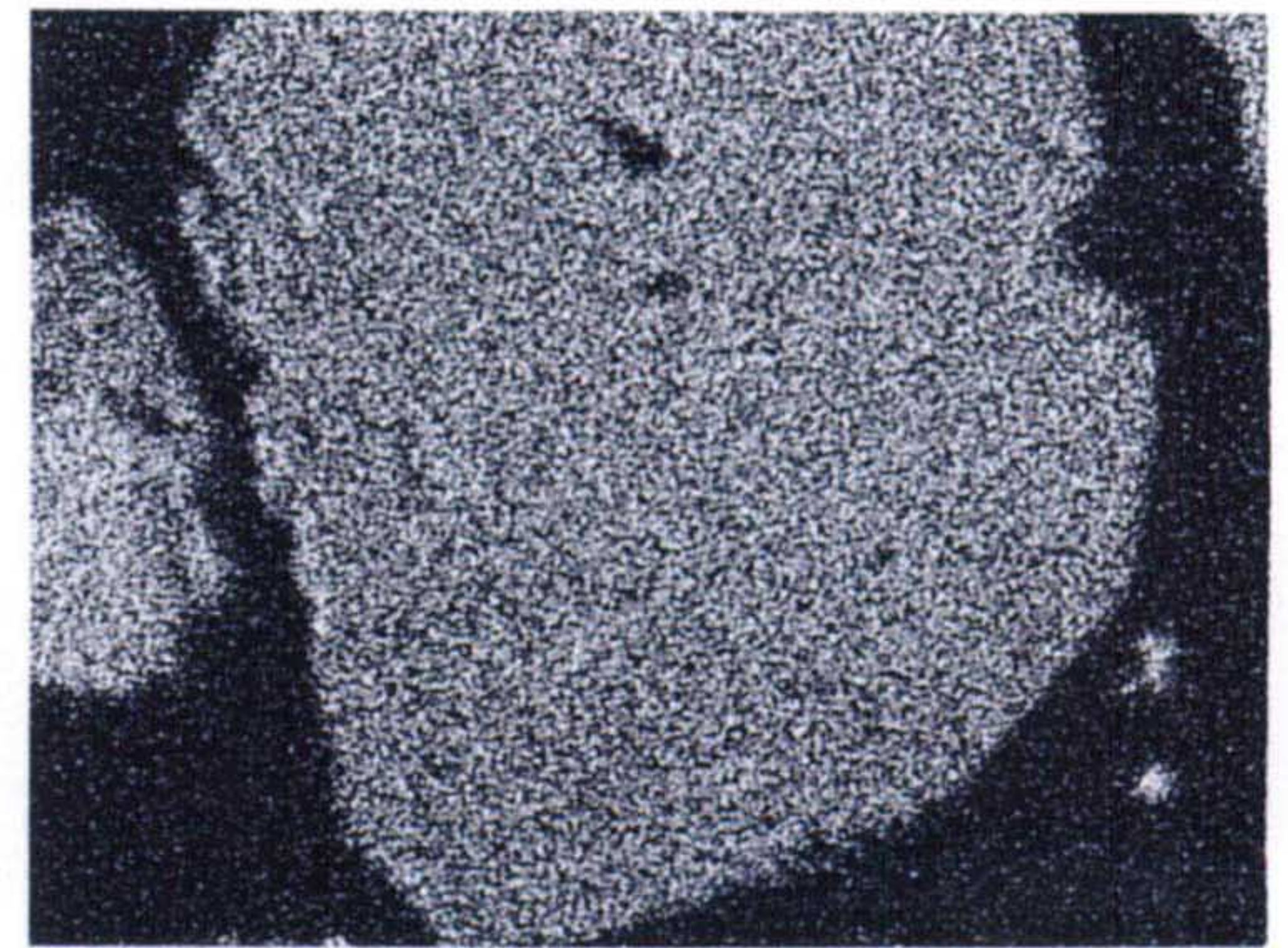
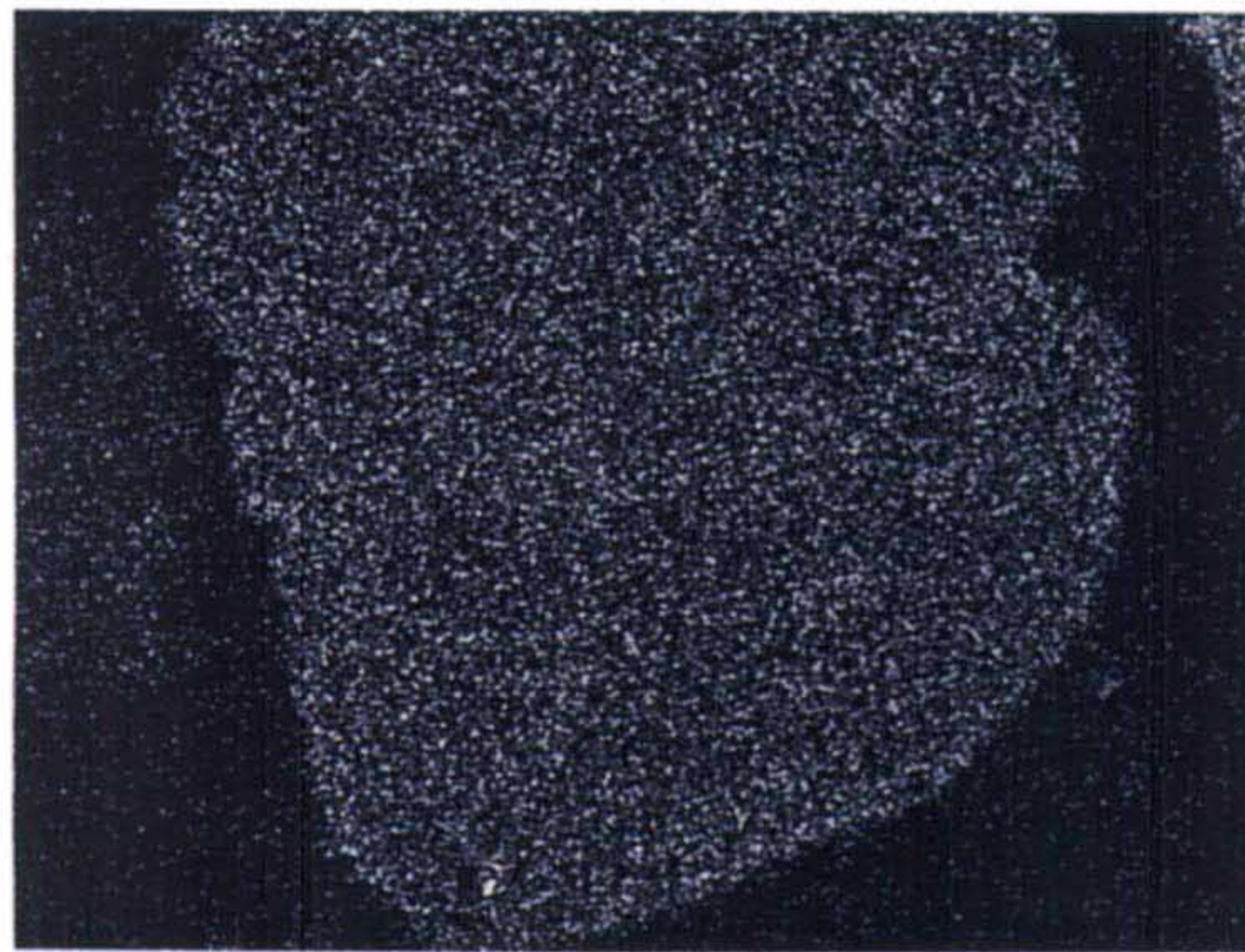
\*撮影フィルム控

Ti

Fe

Mn

O



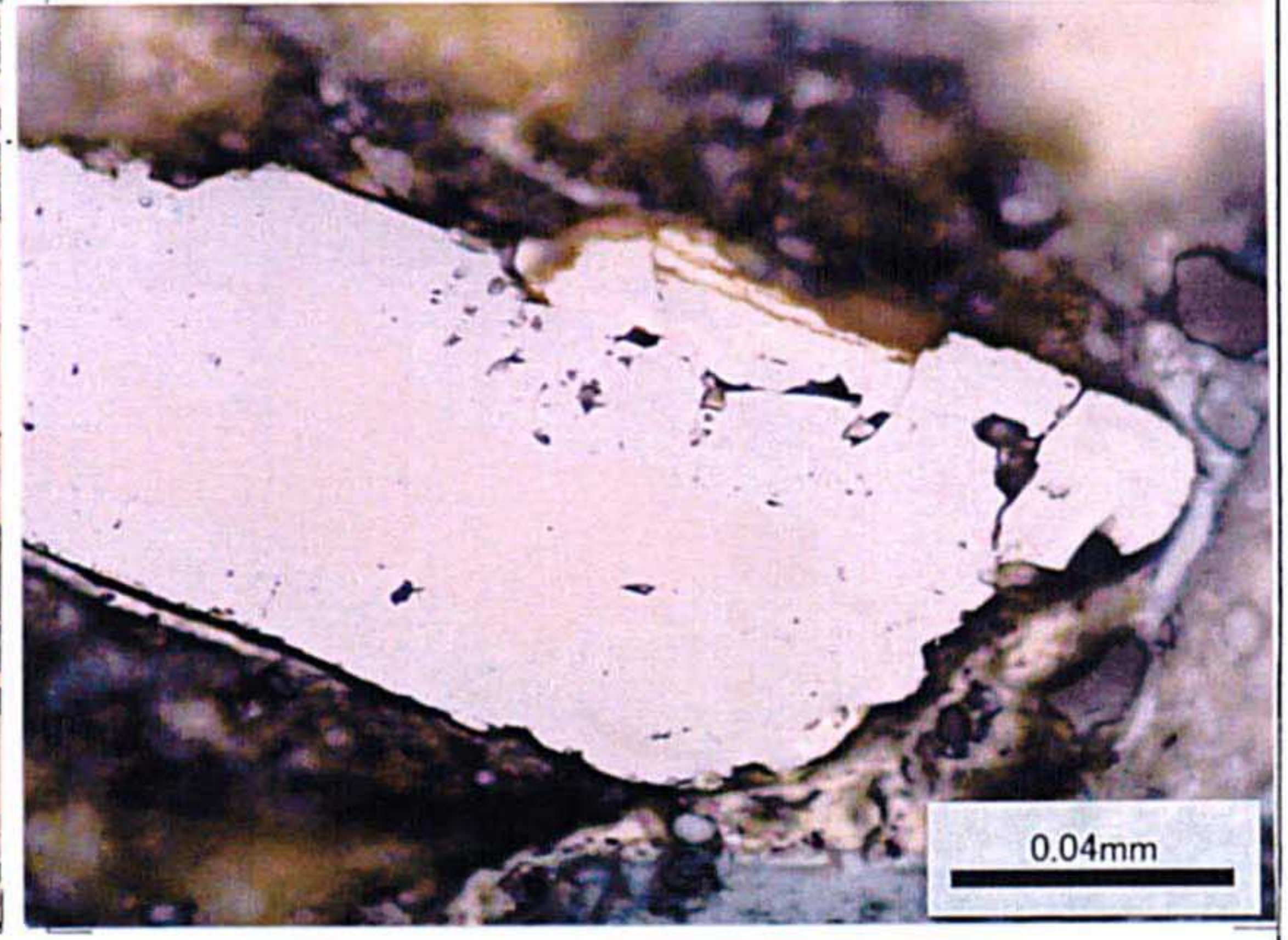
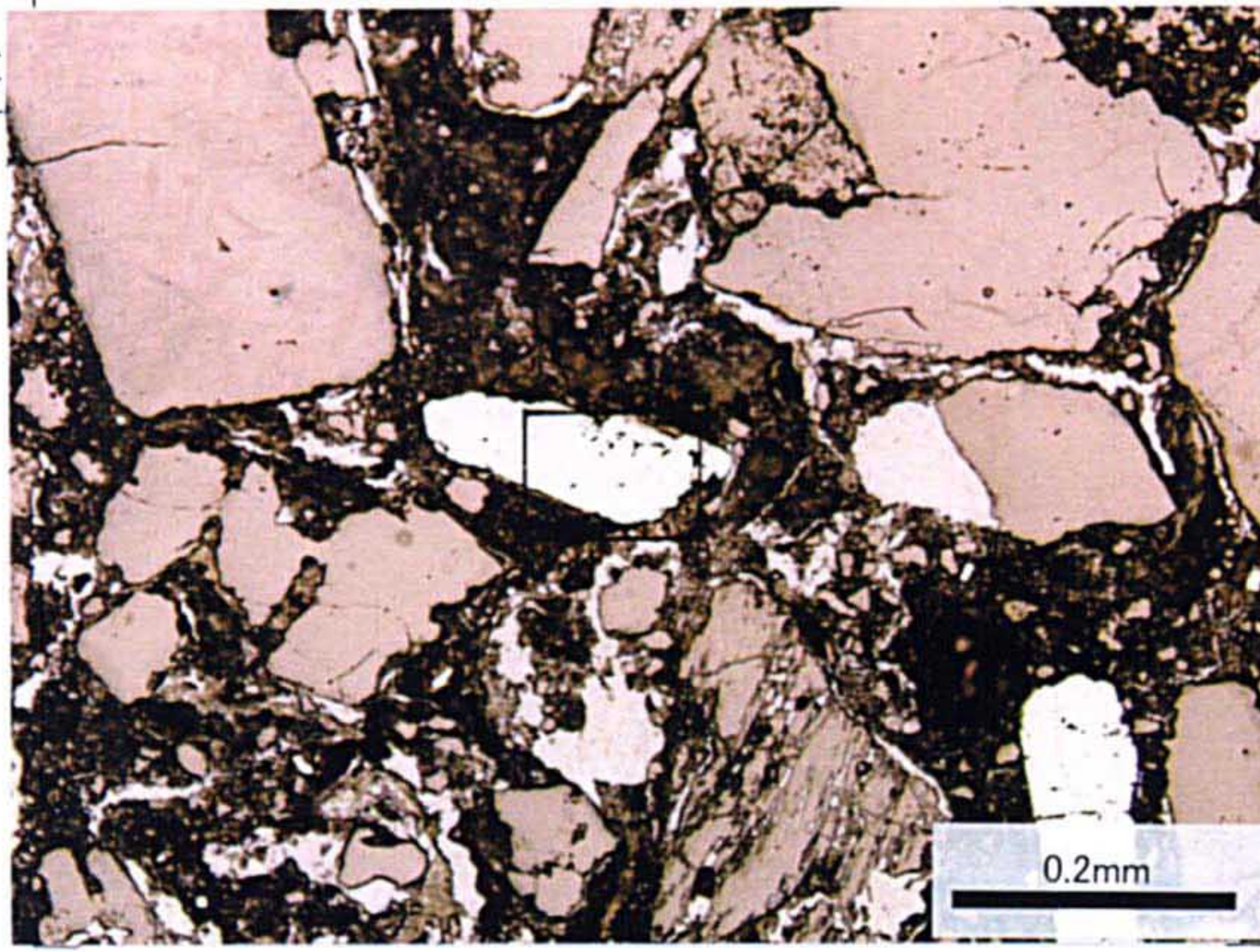


# EPMA試験結果

Ilmenite/Pseudorutile  
from MJBKE-29 14.1m

受付番号	4
試料名	
加速電圧	15 KV
電子線電流	0.05 $\mu$ A
倍率	$\times 1000$
測定年月日	

備考:

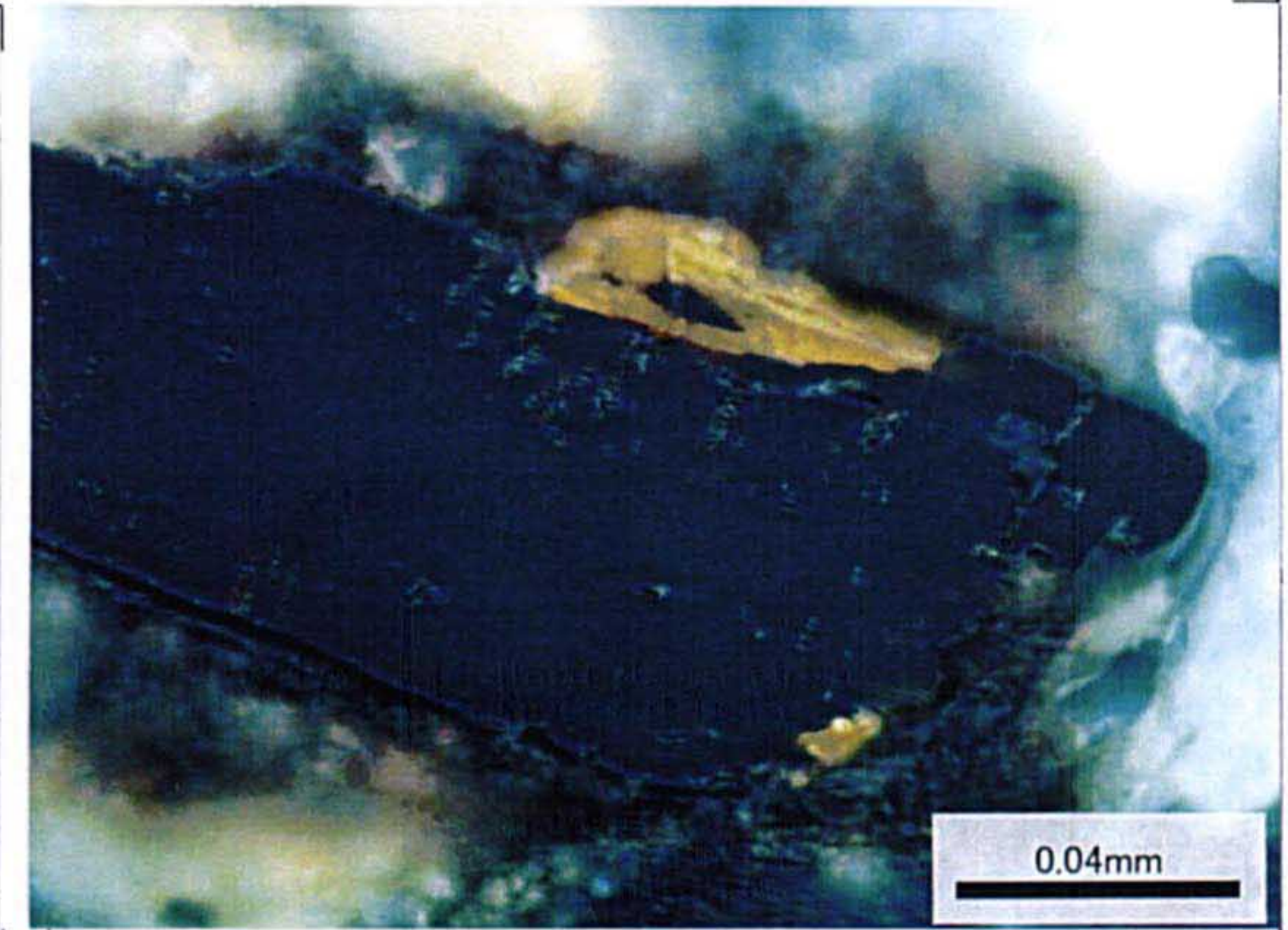
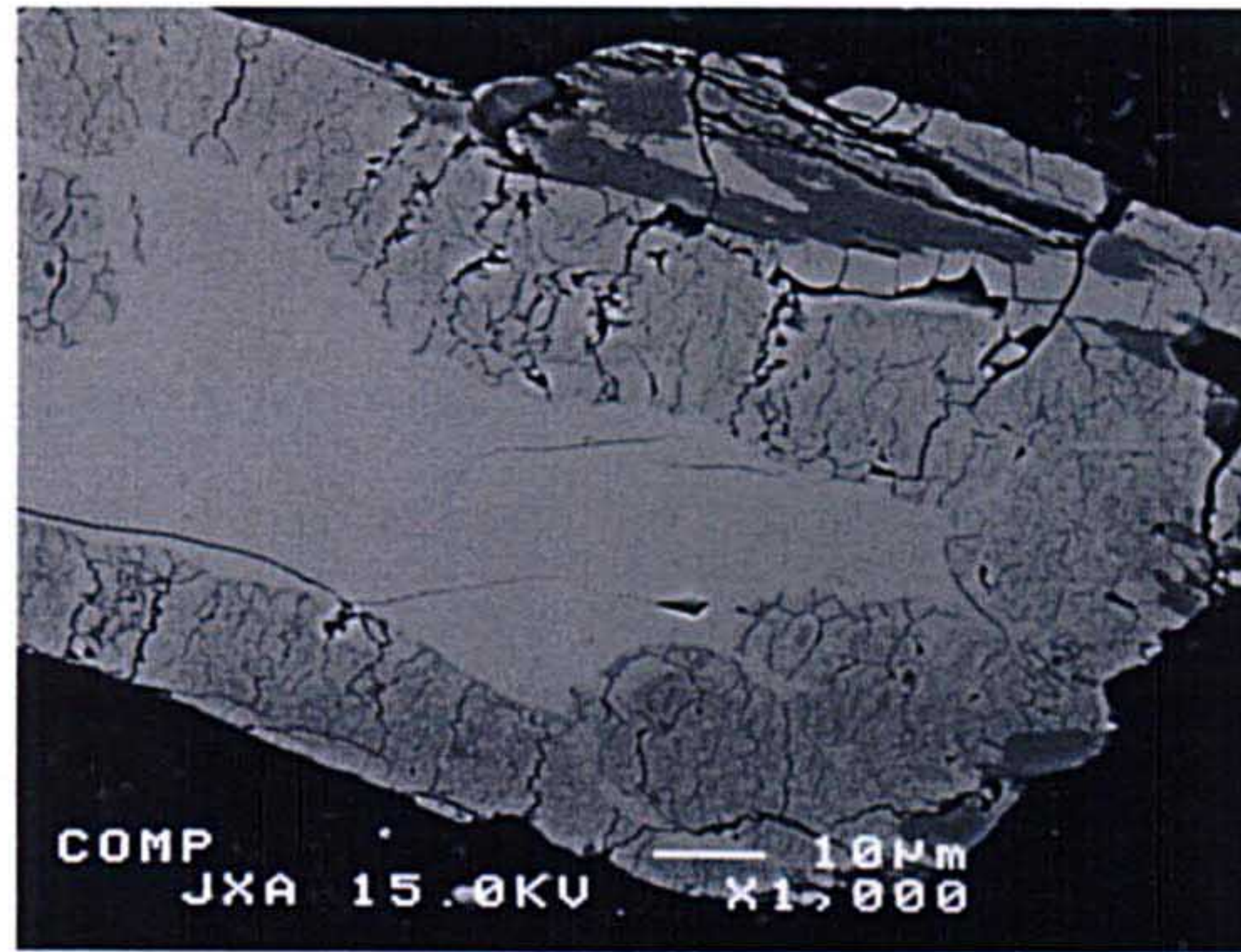


\*撮影フィルム控

Polished section Reflected light	Polished section Reflected light
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組成像

Polished section Reflected light crossed nicols
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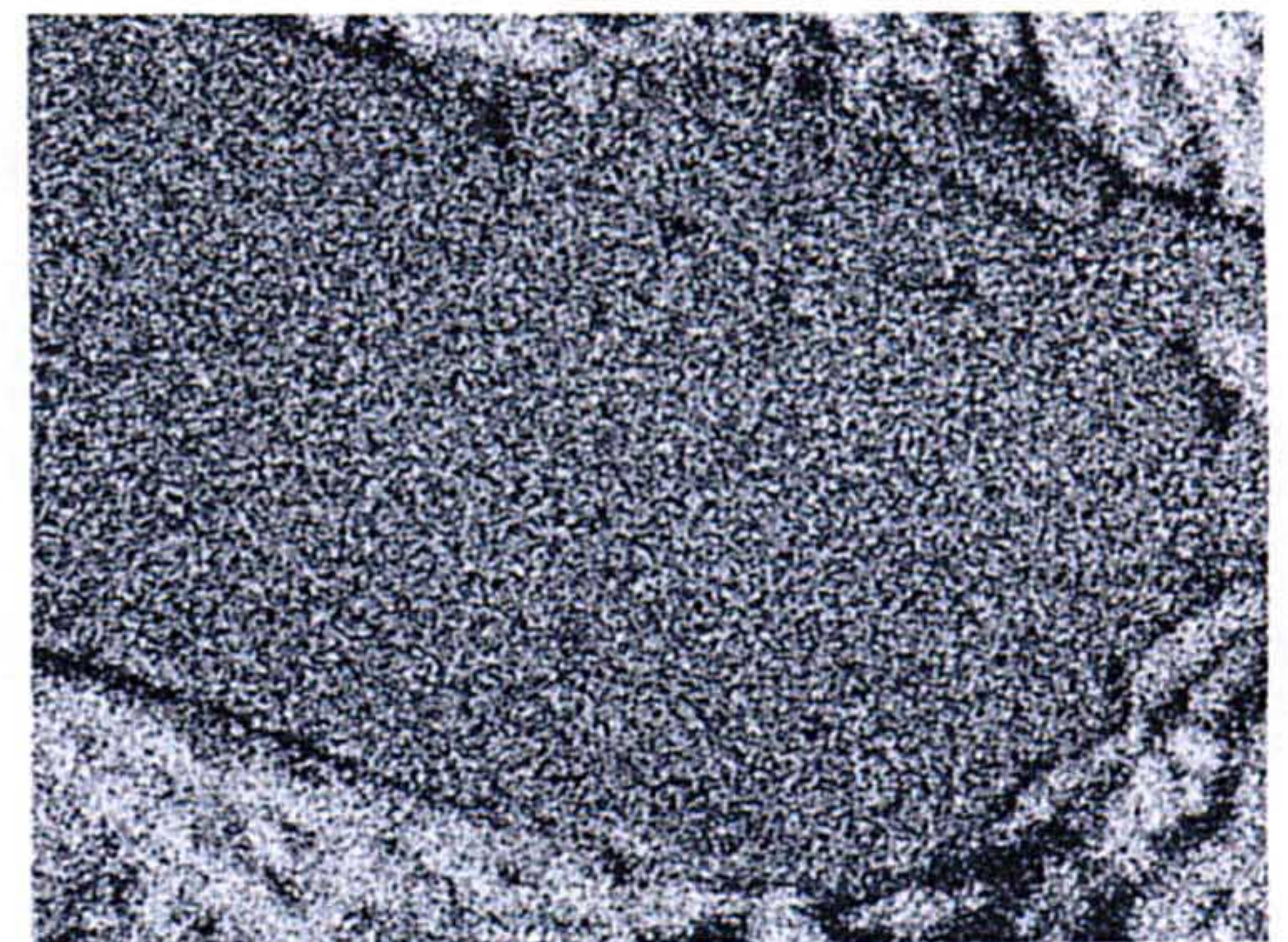
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備考:



\*撮影フィルム控

Ti	Fe
Mn	O



EPL-4

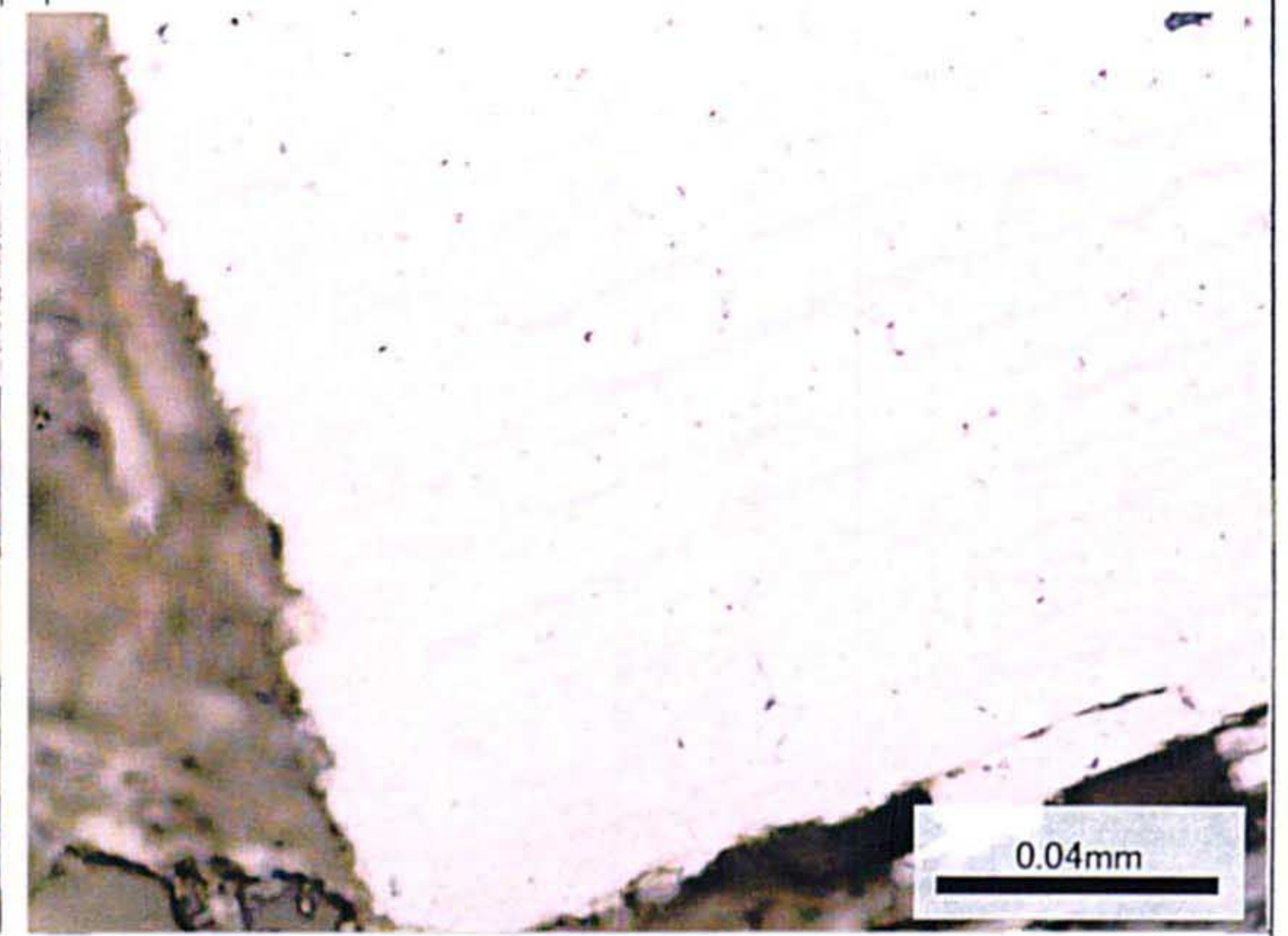
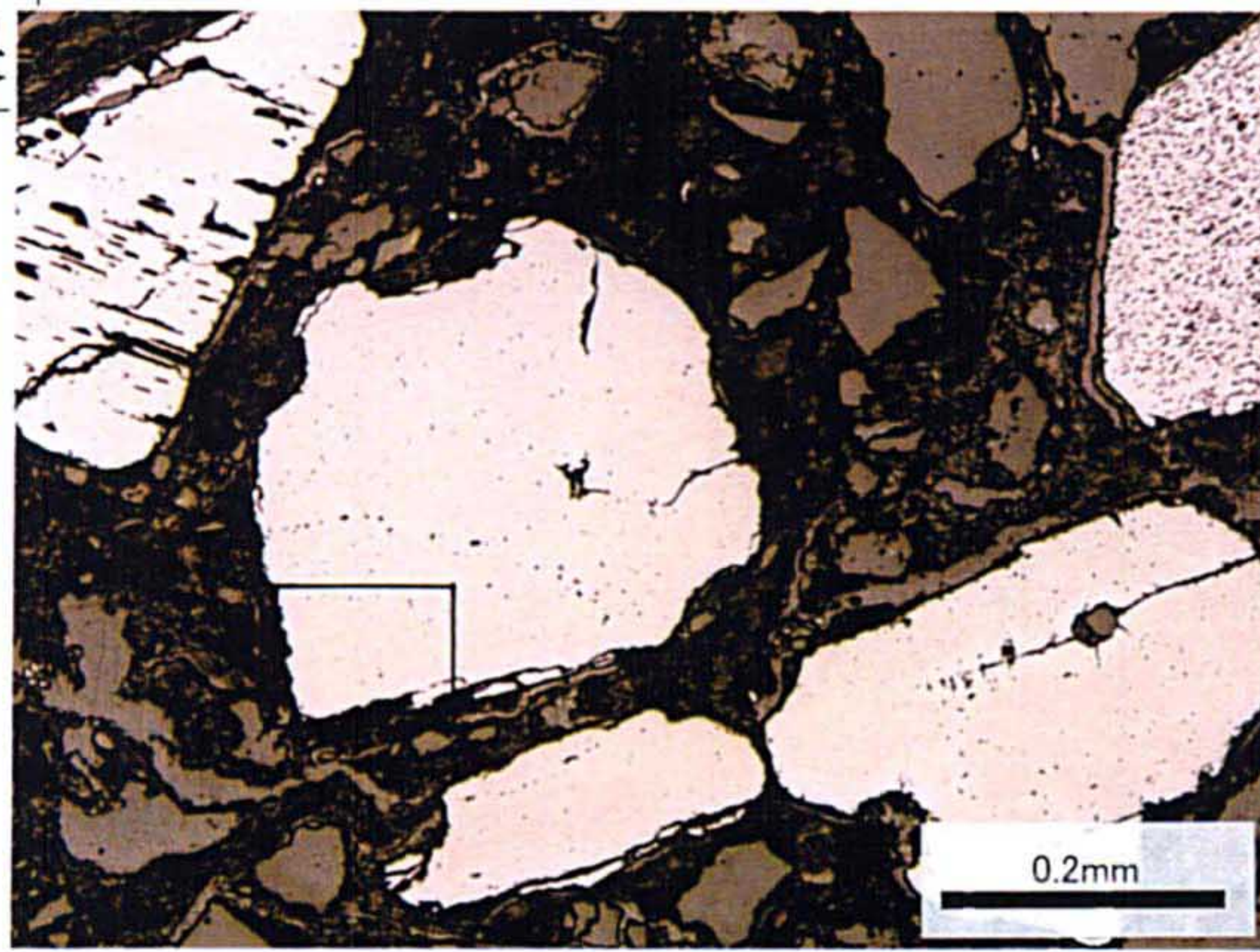


# EPMA試験結果

Pseudorutile  
from MJBKE-33 13.3m

受付番号	5
試料名	
加速電圧	15 KV
電子線電流	0.05 $\mu$ A
倍率	$\times 1000$
測定年月日	

備考:

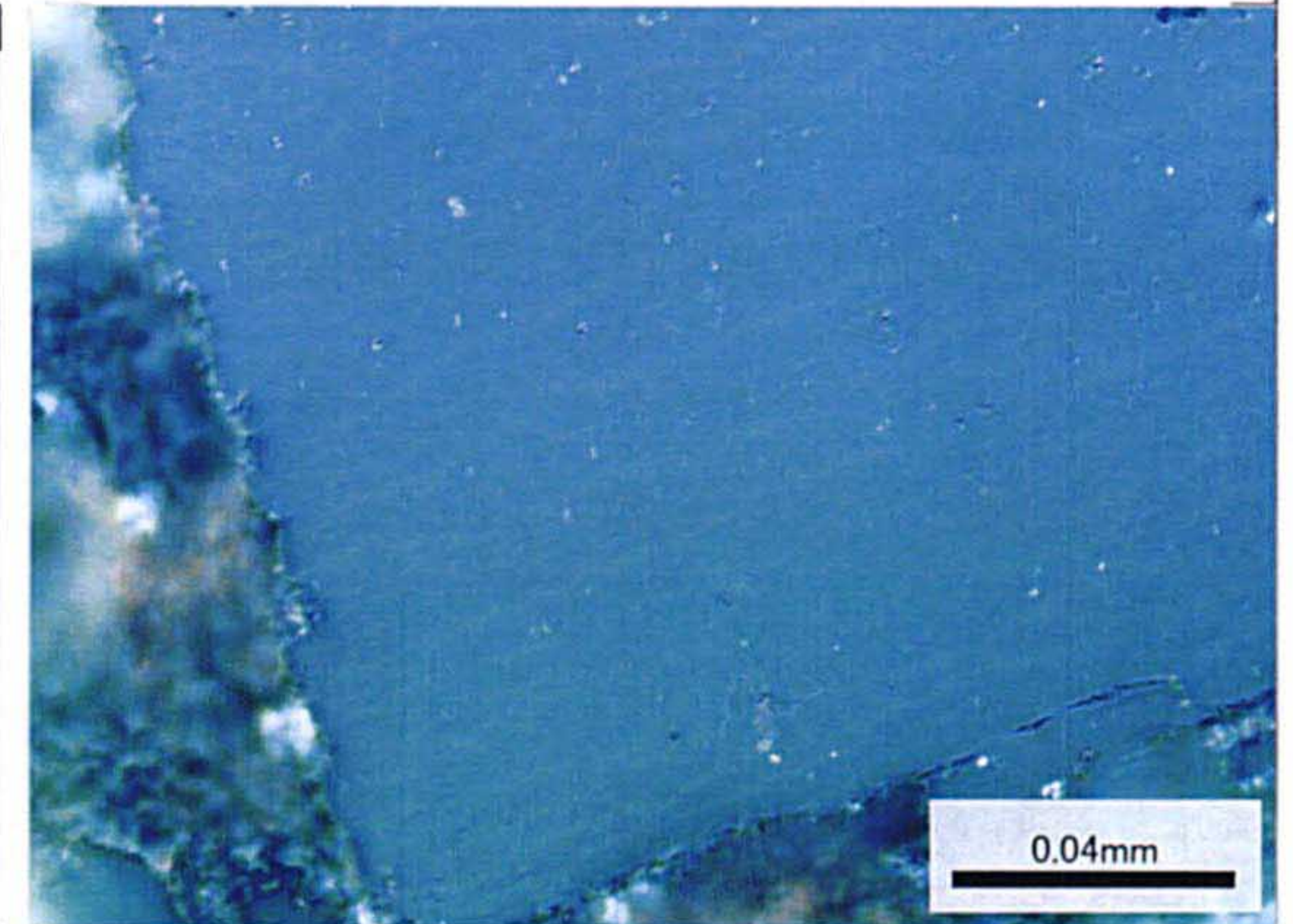
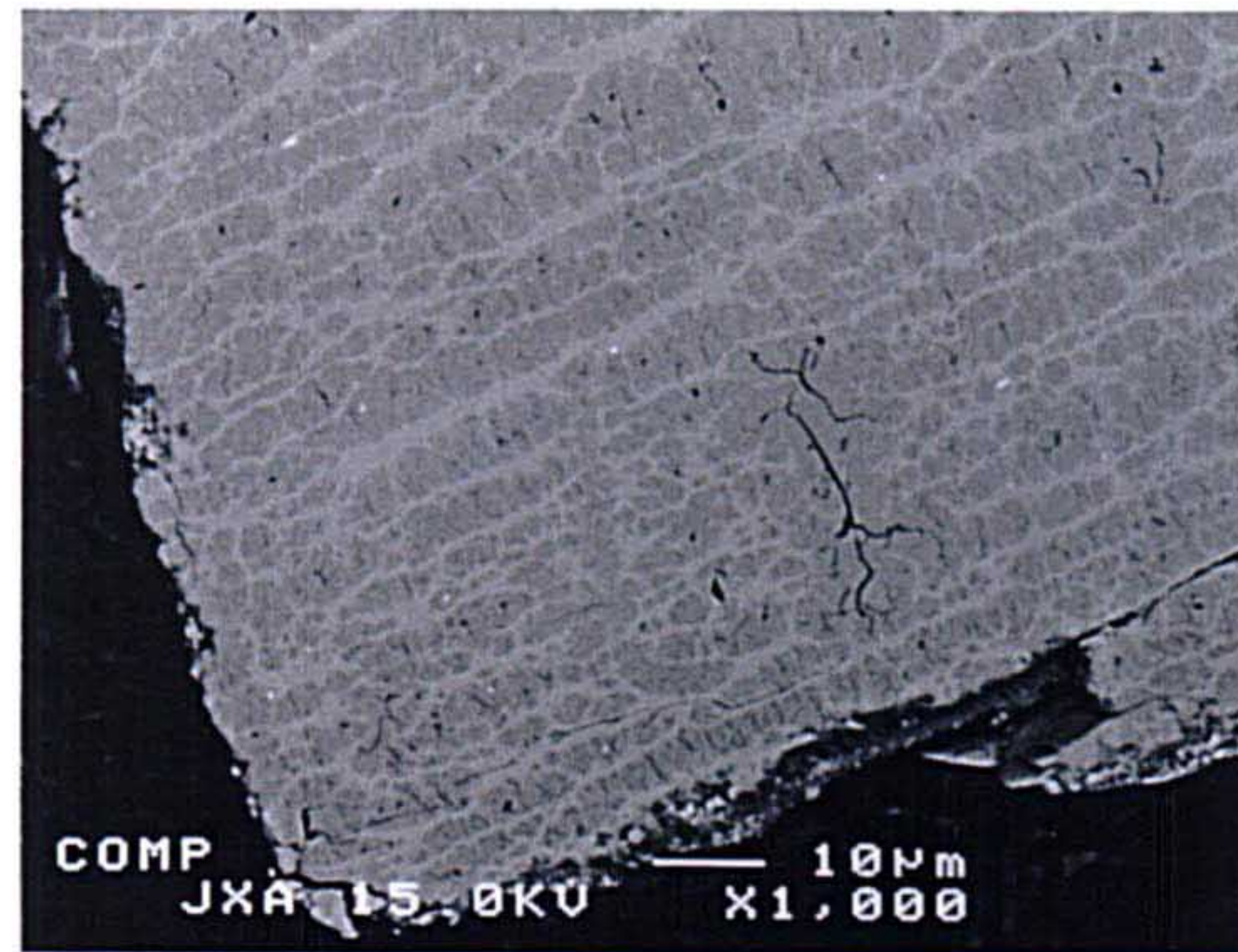


\*撮影フィルム控

Polished section Reflected light	Polished section Reflected light
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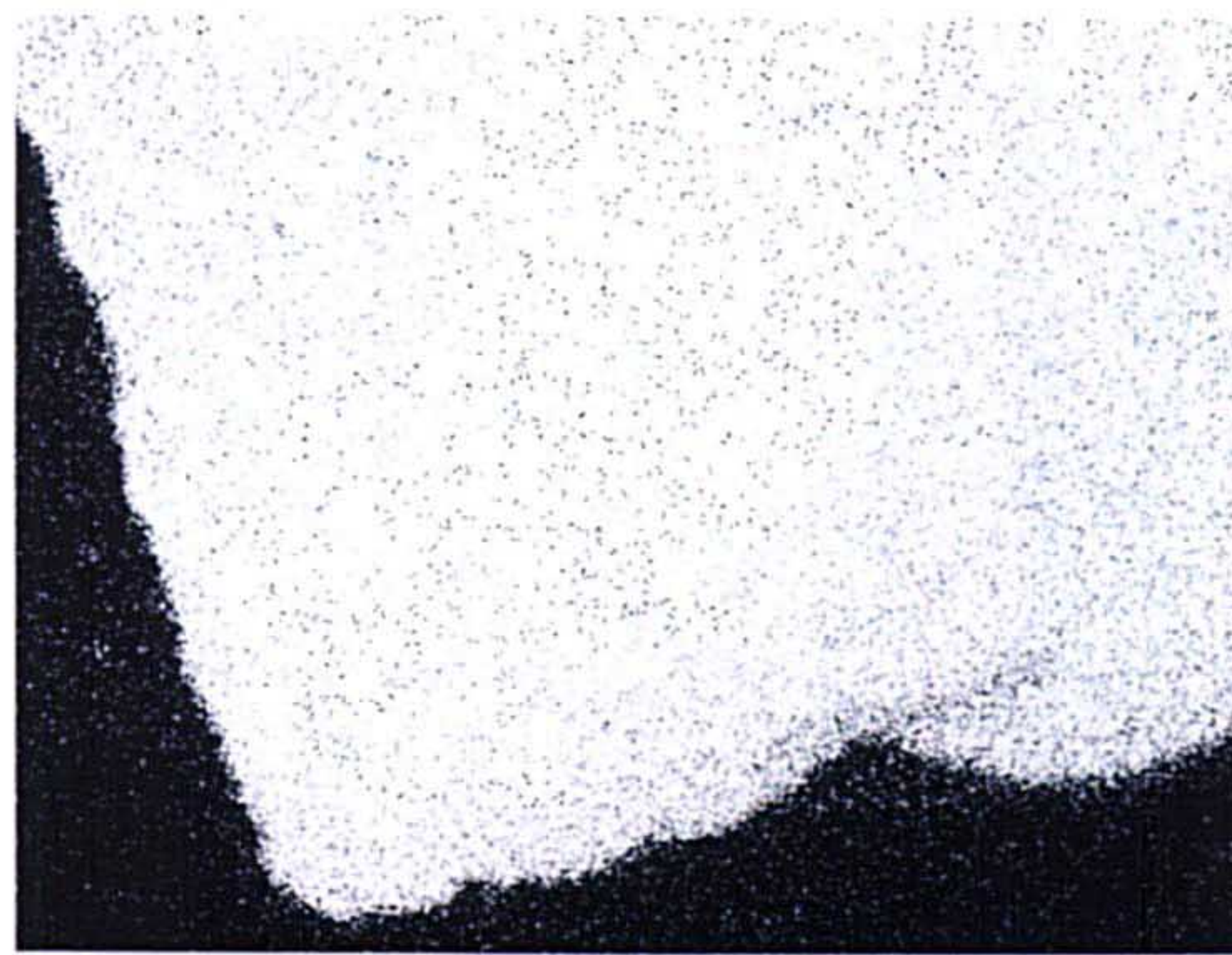
組成像

Polished section Reflected light crossed nicols
---



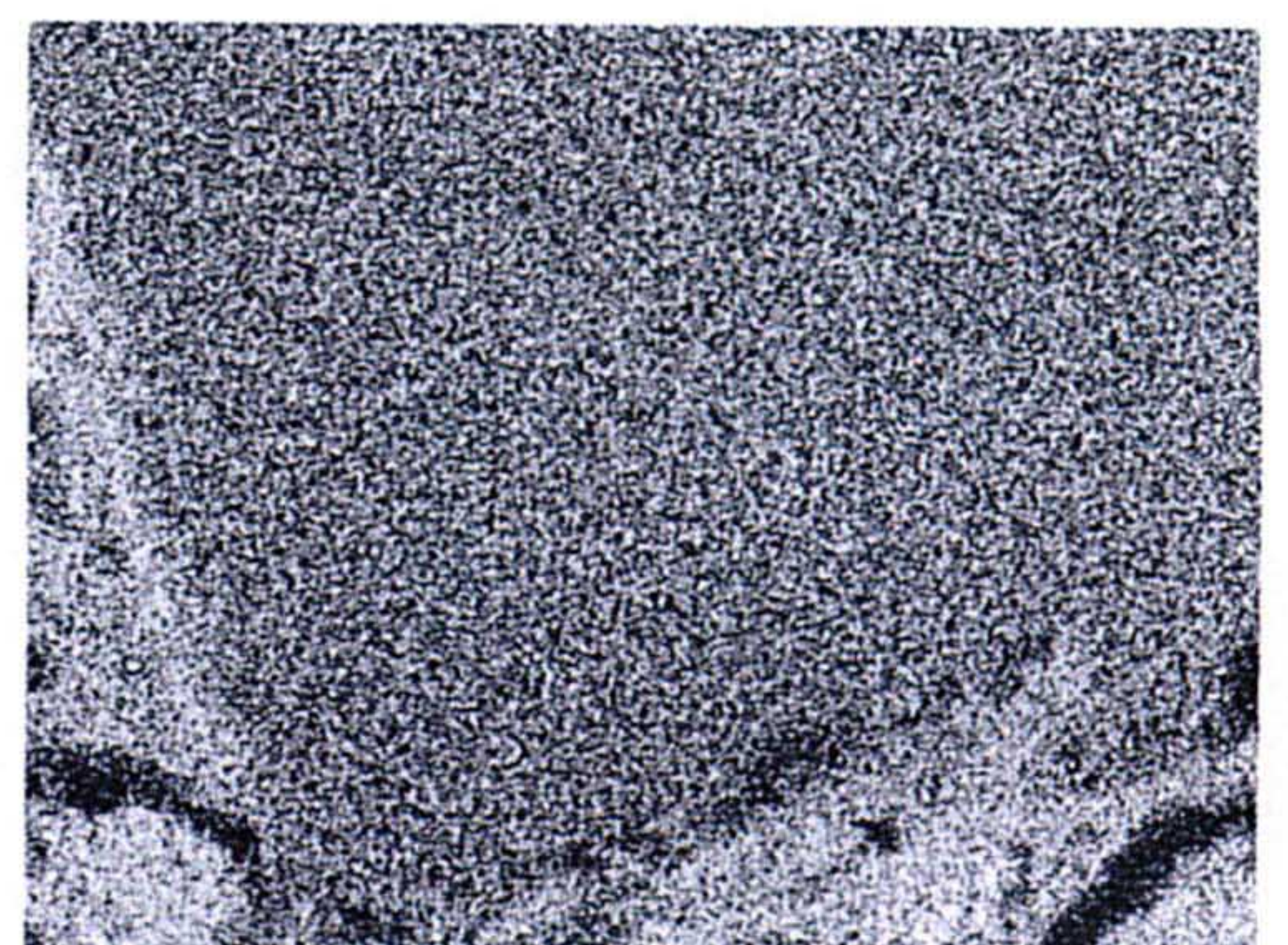
**MITSUI KINZOKU**  
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備考:



\*撮影フィルム控

Ti	Fe
Mn	O



EPL-5

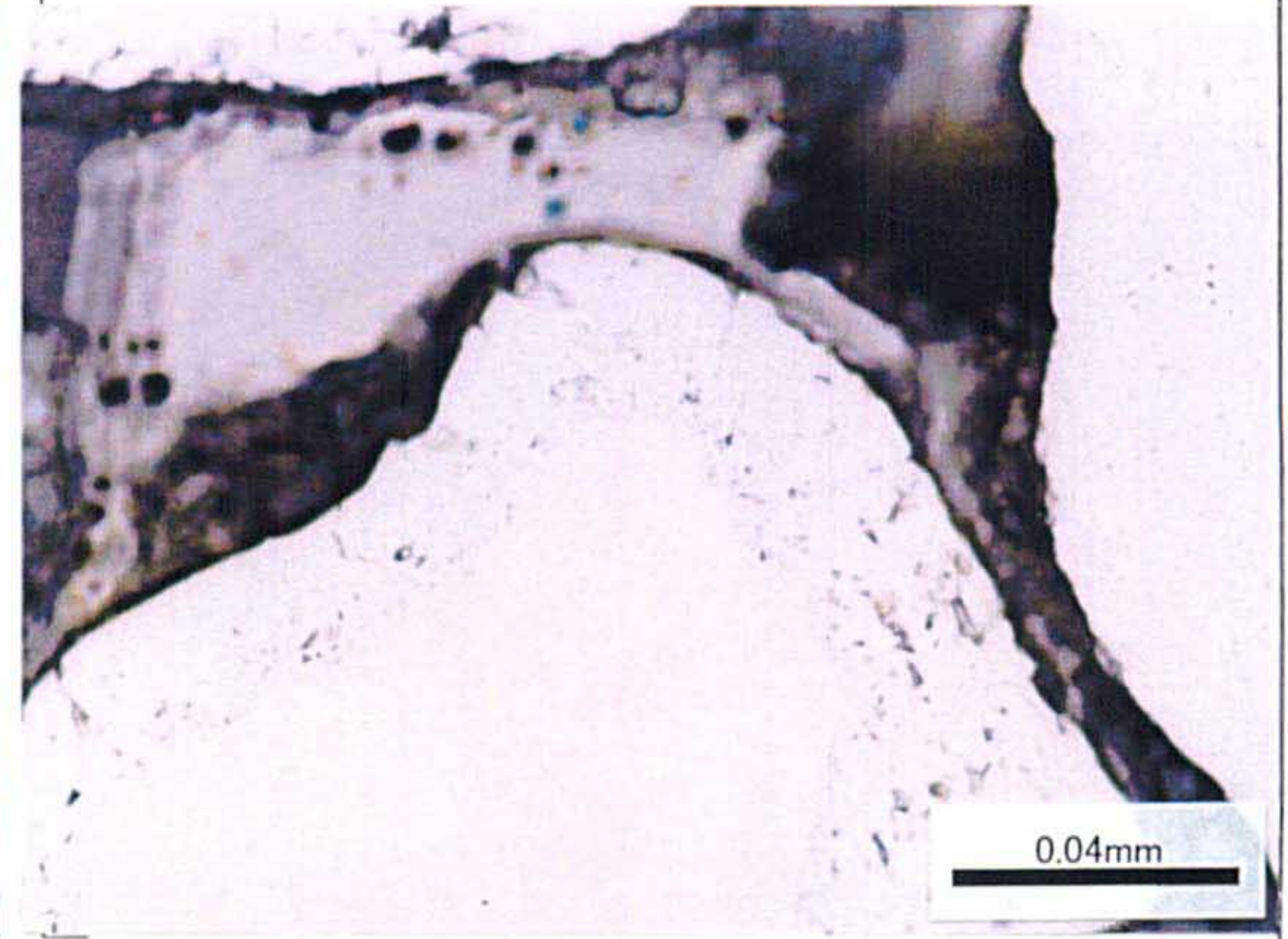
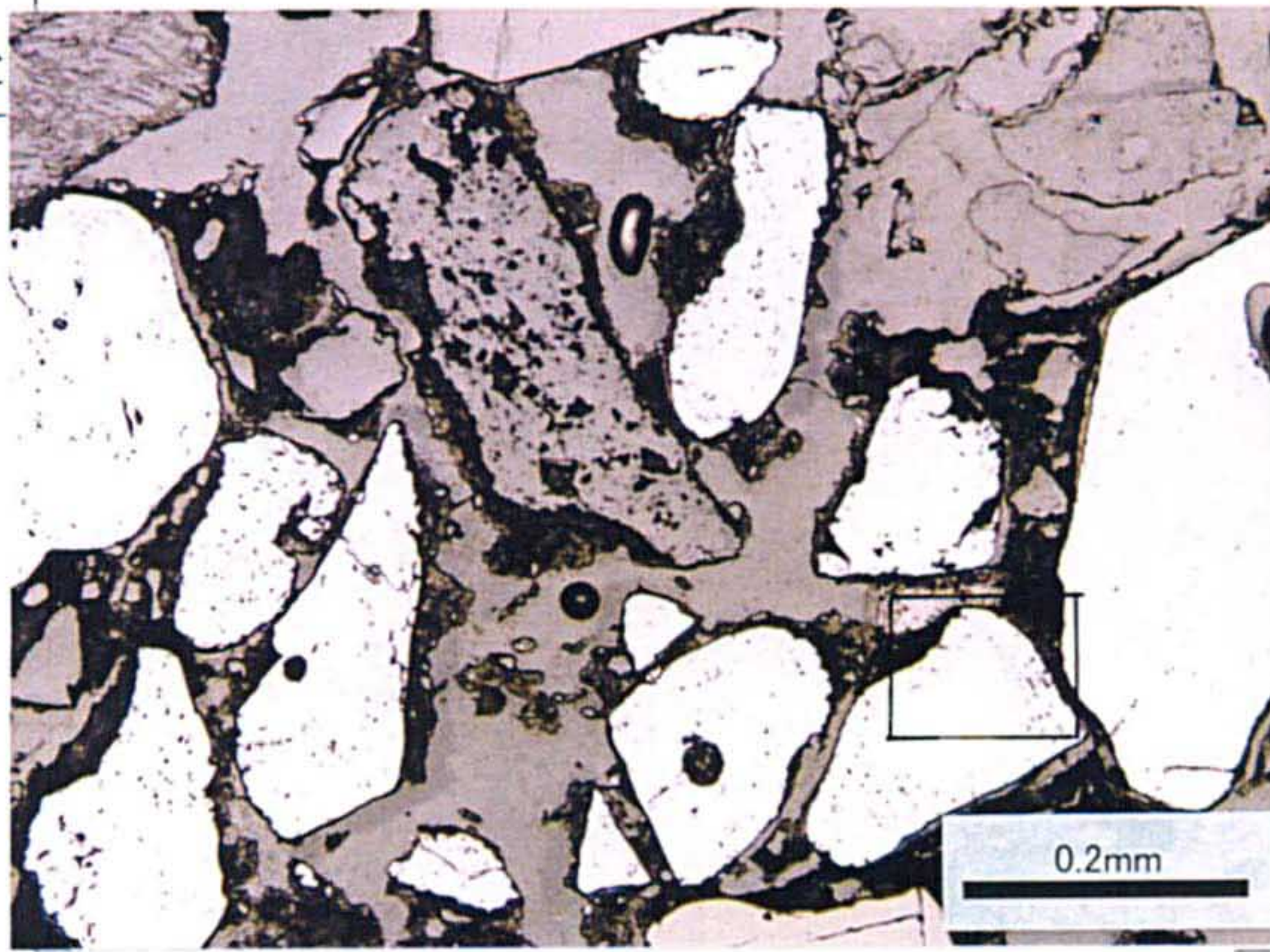


# EPMA試験結果

Ilmenite/Pseudorutile  
from MJBK-54 57.5m

受付番号	6
試料名	
加速電圧	15 KV
電子線電流	0.05 $\mu$ A
倍率	$\times 1000$
測定年月日	

備考:

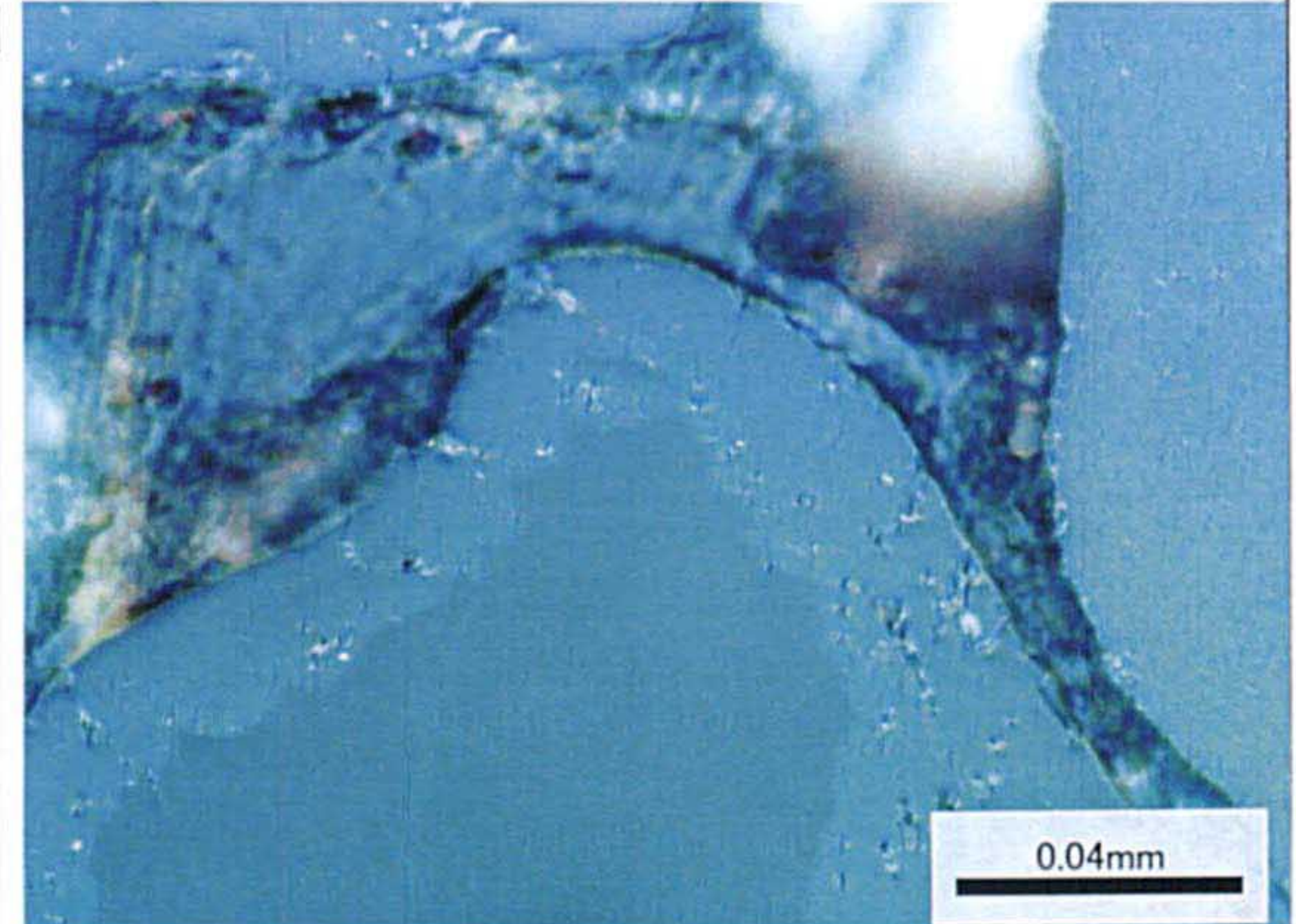


\*撮影フィルム控

Polished section Reflected light	Polished section Reflected light
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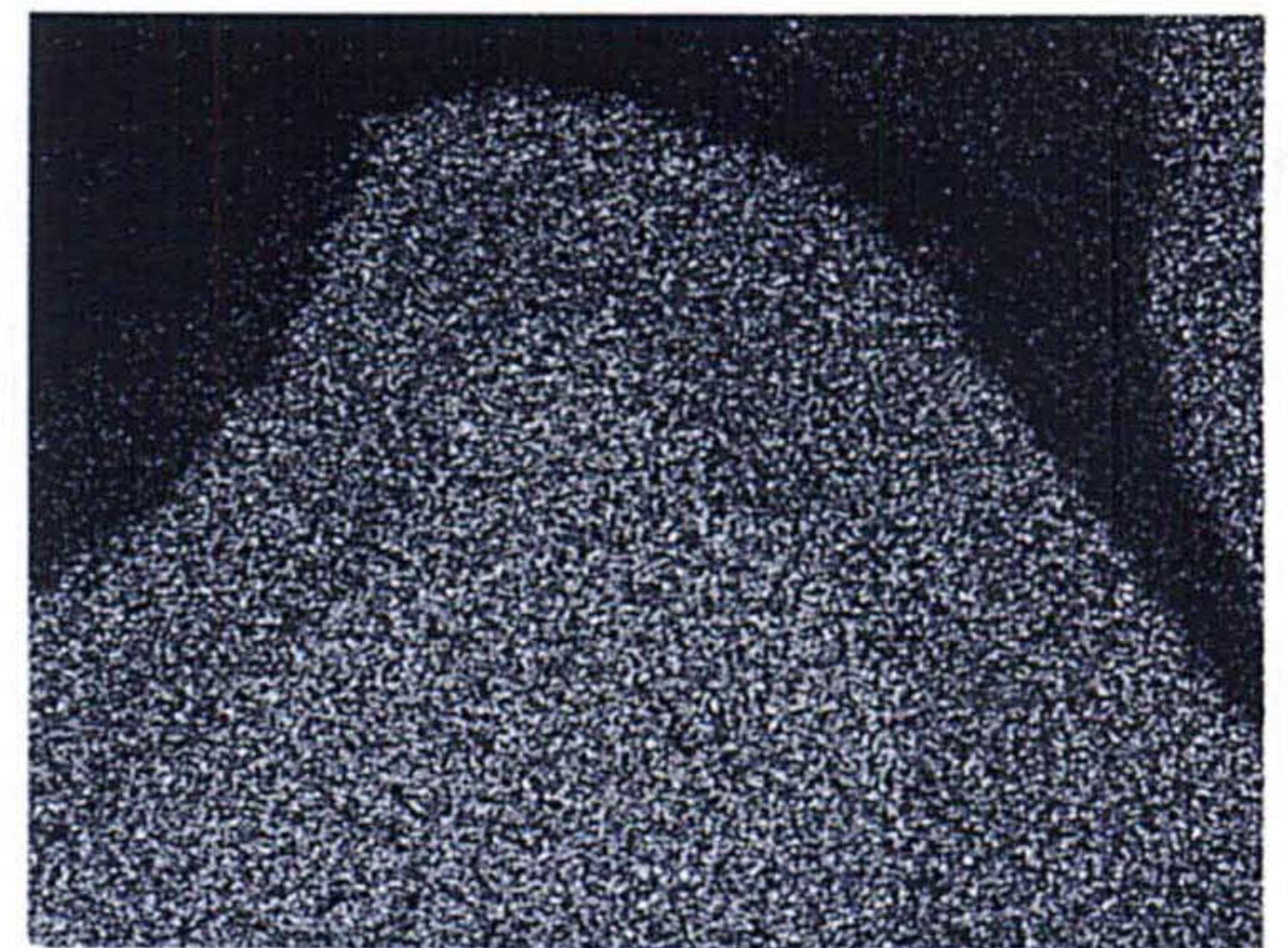
組成像

Polished section Reflected light crossed nicols
---



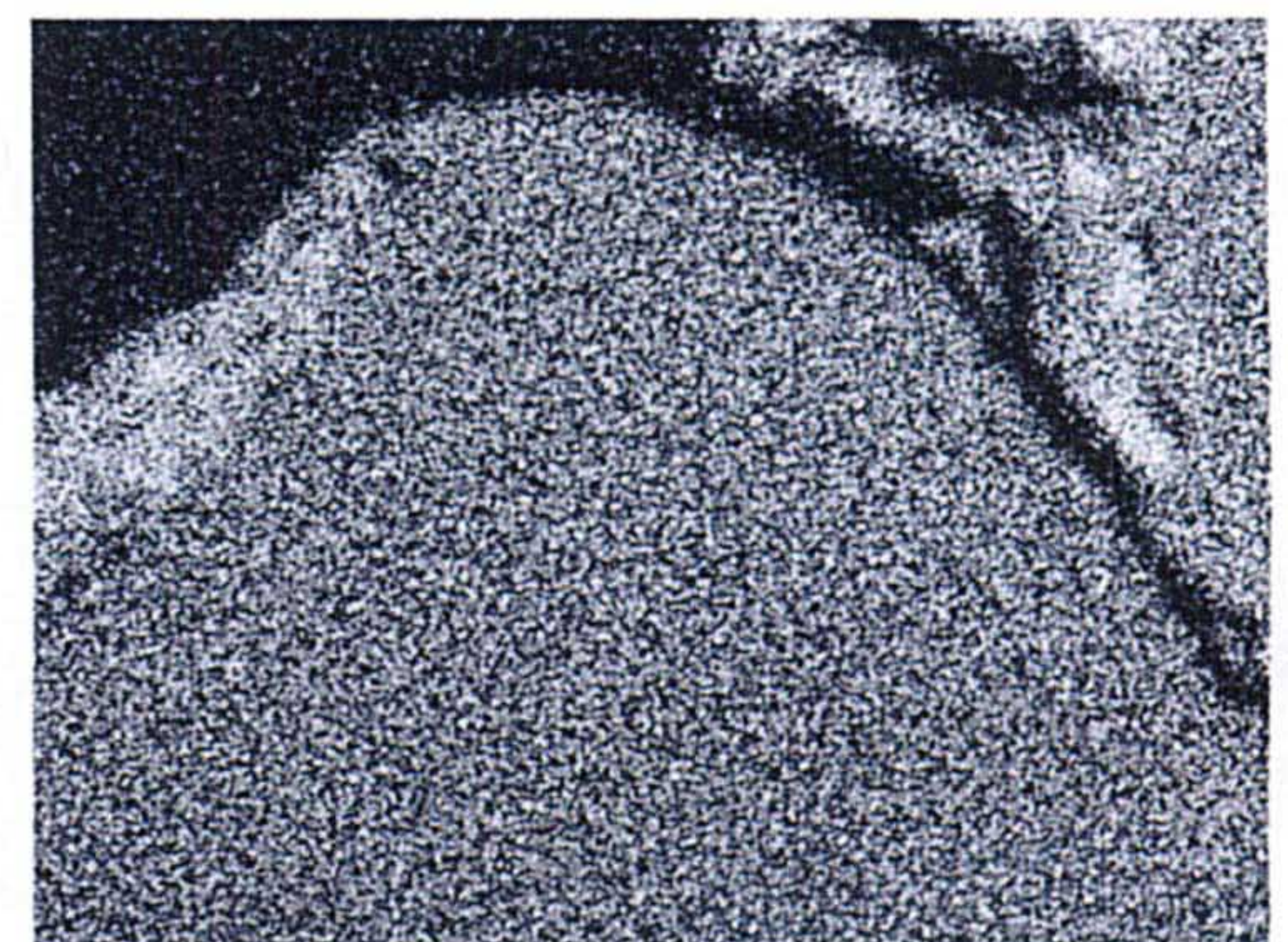
**MITSUI KINZOKU**  
CORPORATE R & D CENTER

備考:

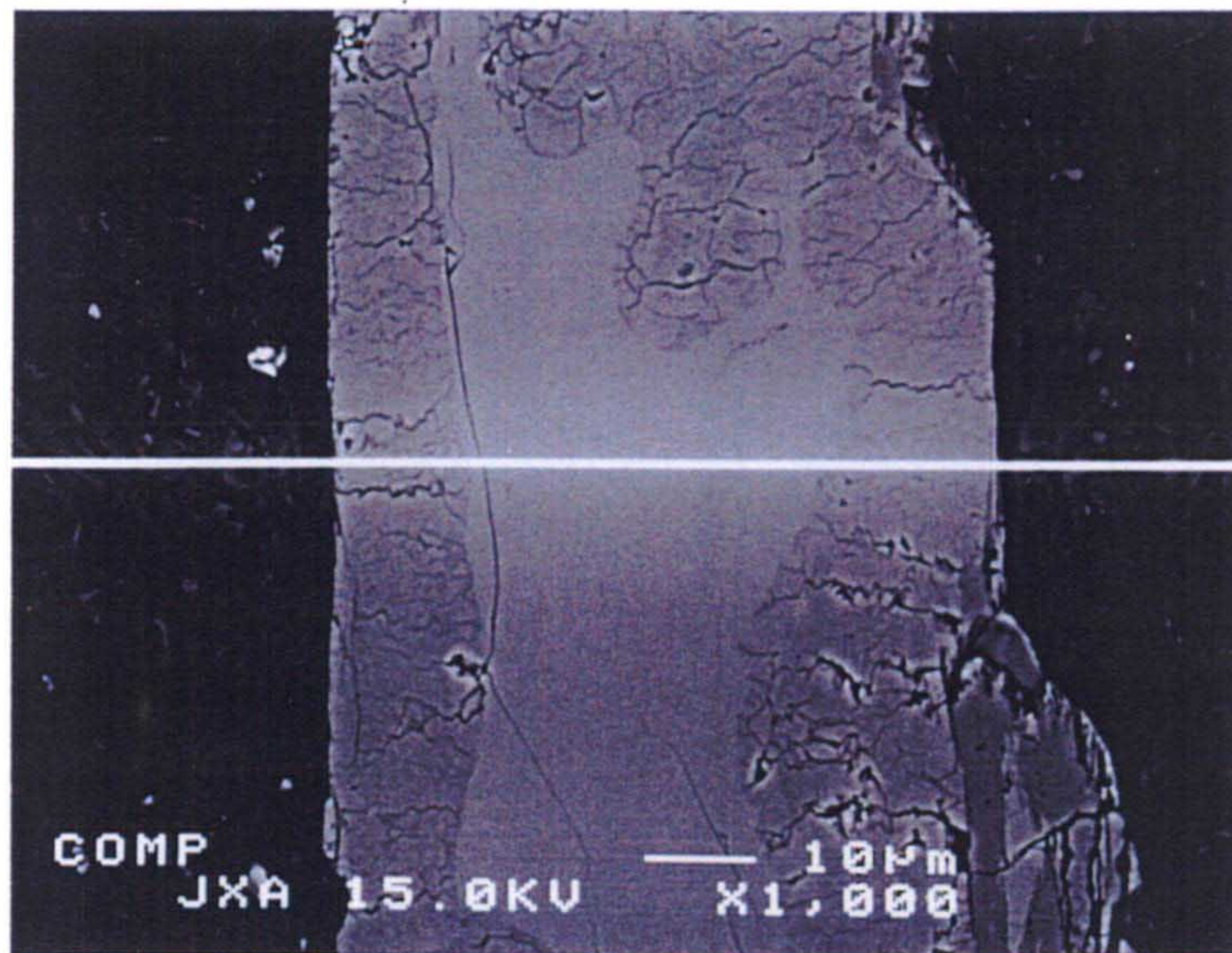


\*撮影フィルム控

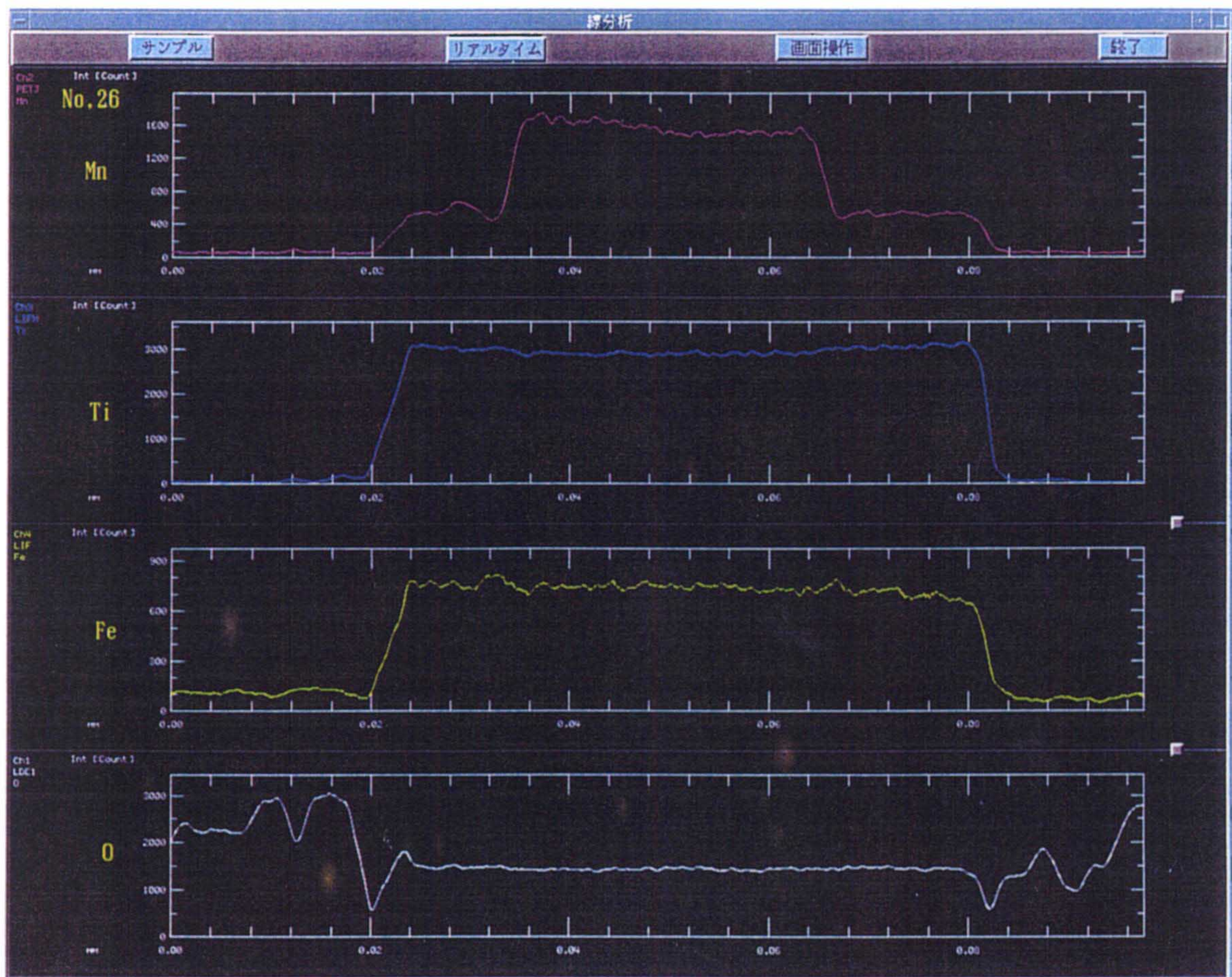
Ti	Fe
Mn	O







Ilmenite/Pseudorutile  
from MJBKE-29 14.1m



EPMA LINE ANALYSIS RESULT Ilmenite



**Appendix 2-9 Mineralogical Analysis of The Karaotkel  
deposits**







Appendix 2-9 Mineralogical Analysis of The Karatkel deposit

No.	LINE No.	DRILL HOLE No.	HOLE DISTANCE (m)	COLLAR ELEVATION (m)	QUATERNARY BASEMENT		TERTIARY BASEMENT		TOTAL DEPTH OF HOLE (m)	BED ROCK LITHOLOGY	HEAVY MINERAL CONCENTRATION					HANGIN G-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENTE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )	DEPOSIT TYPE	Ore Thickness (m)	ILMENTE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )	DEPOSIT TYPE		
					QUATERNARY DEPTH (m)	QUATERNARY RISE ELEVATION (m)	TERTIARY DEPTH (m)	TERTIARY RISE ELEVATION (m)			HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENTE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )											DEPOSIT TYPE	
111	XLV	3865	102	456.3	7.3	449.0	28.0	428.3	20.7	29.0	Syenite	21.5	28.7	7.2	27.0	5.0	Eluvial/Alluvial										
112	XLV	2221	98	457.0	6.8	450.2	30.0	427.0	23.2	32.0	Syenite	24.0	32.0	8.0	25.7	4.7	Eluvial/Alluvial										
113	XLV	3777	104	457.2	5.0	452.2	22.0	435.2	17.0	23.0	Syenite	18.3	23.0	4.7	13.9	2.9	Eluvial/Alluvial										
114	XLV	2222	96	459.2	14.5	444.7	19.0	440.2	4.5	21.6	Syenite	17.3	19.0	1.7	27.9	2.1	Eluvial/Alluvial										
115	XLV	3864	104	460.9	14.5	446.4	25.5	435.4	11.0	28.0	Syenite	23.5	25.5	2.0	9.0	1.0	Alluvial										
116	XLV	2223	96	461.1	11.0	450.1	29.0	432.1	18.0	30.6	Monzonite	24.5	28.0	3.5	23.2	3.7	Alluvial										
117	XLV	3863	106	462.1	13.0	449.1	27.3	434.8	14.3	30.0	Monzonite	20.0	29.3	9.3	22.2	4.6	Eluvial/Alluvial	35.2	37.2	2.0	50.1	11.8	Alluvial				
118	XLV	2224	86	463.3	8.0	455.3	30.0	433.3	22.0	32.0	Monzonite	26.1	32.0	5.9	26.2	3.8	Eluvial/Alluvial										
119	XLV	3862	96	464.1	8.5	455.6	39.2	424.9	30.7	40.0	Monzonite	25.5	40.0	14.5	21.9	2.0	Eluvial/Alluvial										
120	XLV	2225	104	464.9	14.1	450.8	14.1	450.8		14.1	Monzonite																
121	XLV	2225A	198	468.3	13.6	454.7	13.6	454.7		13.6	Syenite																
122	XLIII	2227	83	449.3	3.5	445.8	8.2	441.1	4.7	16.1	Monzonite	8.2	16.0	7.8	20.4	1.8	Eluvial										
123	XLIII	1574	94	449.0	3.3	445.7	5.8	443.2	2.5	12.0	Syenite	5.8	7.0	1.2	18.1	1.3	Eluvial										
124	XLIII	3857	110	448.7	3.8	444.9	9.8	438.9	6.0	12.0	Syenite	9.0	18.0	9.0	16.9	2.2	Eluvial/Alluvial										
125	XLIII	2228	195	448.7	6.1	442.6	6.1	442.6		16.0	Syenite	6.1	16.0	9.9	23.9	1.4	Eluvial	7.0	8.9	1.9	52.4	1.7	Eluvial				
126	XLIII	3858	108	449.7	4.7	445.0	4.7	445.0		18.5	Syenite	4.7	18.0	13.3	27.2	3.1	Eluvial/Alluvial										
127	XLIII	2229	93	450.3	5.5	444.8	5.5	444.8		17.6	Monzonite	7.5	17.5	10.0	36.9	2.5	Eluvial	14.4	17.2	2.8	57.3	3.7	Eluvial				
128	XLIII	3859	106	451.1	8.2	442.9	8.2	442.9		16.2	Monzonite	8.2	16.2	8.0	14.5	1.5	Eluvial										
129	XLIII	2088	94	451.4	5.8	445.6	23.3	428.1	17.5	27.7	Monzonite	17.5	27.5	10.0	20.2	3.6	Eluvial/Alluvial										
130	XLIII	3860	104	450.8	6.2	444.6	18.0	432.8	11.8	28.5	Monzonite	16.0	28.0	12.0	15.8	5.9	Eluvial/Alluvial										
131	XLIII	2089	84	452.8	5.8	447.0	18.8	434.0	13.0	28.5	Monzonite	19.0	25.7	6.7	24.2	2.0	Eluvial										
132	XLIII	3861	100	454.3	4.5	449.8	22.8	431.7	18.1	25.2	Monzonite	15.0	25.2	10.2	17.5	3.0	Eluvial/Alluvial										
133	XLIII	2090	100	455.5	13.0	442.5	13.0	442.5		22.6	Monzonite	12.0	22.5	10.5	25.5	2.3	Eluvial/Alluvial										
134	XLIII	2091	198	456.3	11.2	445.1	11.2	445.1		24.0	Monzonite	8.2	16.0	7.8	20.4	1.8	Eluvial/Alluvial	15.0	17.0	2.0	54.3	3.5	Eluvial				
135	XLIII	2092	200	458.4	11.6	446.8	11.6	446.8		15.5	Monzonite																
136	XLIII	2248	194	460.8	2.0	458.8	2.0	458.8		4.2	Monzonite																
137	XLIII	2252	408	462.8	2.8	460.0	2.8	460.0		11.5	Monzonite	2.8	11.2	8.4	13.8	1.9	Eluvial										
138	XLIII	2258	404	465.2	2.5	462.7	2.5	462.7		3.8	Monzonite																
139	XLI	2230	92	449.2	5.7	443.5	22.2	427.0	16.5	25.3	Syenite	15.3	25.2	9.9	21.2	4.0	Eluvial/Alluvial										
140	XLI	3855	92	447.0	4.4	442.6	20.2	426.8	15.8	23.5	Syenite	13.0	23.0	10.0	18.4	3.8	Eluvial/Alluvial										
141	XLI	2231	106	447.0	1.0	446.0	14.5	432.5	13.5	16.4	Syenite	9.0	13.0	4.0	12.8	2.9	Alluvial										
142	XLI	3856	104	446.4	2.8	443.6	13.8	432.6	11.0	17.5	Syenite	12.0	17.0	5.0	12.5	2.4	Eluvial/Alluvial										
143	XLI	2232	106	445.5	4.2	441.3	7.4	438.1	3.2	17.0	Syenite	4.2	18.9	12.7	15.0	2.3	Eluvial/Alluvial										
144	XLI	2233	192	444.5	4.0	440.5	4.0	440.5		9.1	Syenite	7.0	9.0	2.0	12.2	2.0	Eluvial/Alluvial										
145	XLI	3700	98	444.7	6.1	438.6	6.1	438.6		12.2	Syenite	6.1	10.0	3.9	13.7	2.3	Eluvial/Alluvial										
146	XLI	2234	104	445.4	5.0	440.4	11.7	433.7	6.7	15.1	Syenite	11.7	15.0	3.3	13.3	2.0	Eluvial/Alluvial										
147	XLI	3701	100	444.8	5.0	439.8	20.8	424.0	15.8	21.5	Syenite	13.0	20.8	7.8	21.9	5.2	Alluvial										
148	XLI	2235	100	445.0	5.0	440.0	20.5	424.5	15.5	21.1	Monzonite	13.7	20.5	6.8	19.9	7.7	Alluvial										
149	XLI	3702	104	445.6	5.0	440.6	17.0	428.6	12.0	21.5	Monzonite	12.8	21.3	8.5	20.8	2.6	Eluvial/Alluvial										
150	XLI	2236	90	446.5	1.5	445.0	15.4	431.1	13.9	21.8	Syenite	14.1	21.8	7.7	20.8	2.1	Eluvial/Alluvial										
151	XLI	3703	106	447.7	7.0	440.7	15.0	432.7	8.0	22.3	Syenite	7.0	21.5	14.5	11.5	1.7	Eluvial/Alluvial										
152	XLI	2237	100	448.3	12.3	436.0	12.3	436.0		14.5	Syenite	12.3	14.2	1.9	18.7	1.3	Eluvial										
153	XLI	3704	130	448.6	10.4	439.2	17.0	432.6	6.6	18.0	Monzonite	10.4	17.0	6.6	23.2	1.7	Eluvial										
154	XLI	2238	66	450.3	6.9	443.4	6.9	443.4		20.1	Monzonite	6.9	20.1	13.2	16.9	1.4	Eluvial										
155	XLI	3705	60	450.9	7.8	443.1	7.8	443.1		18.4	Monzonite	7.8	16.0	8.2	21.7	1.6	Eluvial										
156	XLI	3706	90	451.5	7.1	444.4	7.1	444.4		18.6	Monzonite	7.1	10.9	3.8	17.6	1.4	Eluvial										
157	XLI	3707	100	452.0	6.2	445.8	6.2	445.8		15.6	Monzonite	10.3	15.0	4.7	17.8	2.0	Eluvial										
158	XLI	2247	148	453.4	8.5	444.9	8.5	444.9		16.5	Monzonite	8.5	16.4	7.9	29.9	1.3	Eluvial										
159	XXXIX	2342	46	446.4	0.7	445.7	5.0	441.4	4.3	14.0	Syenite	0.2	14.0	13.8	25.8	4.7	Eluvial/Alluvial										
160	XXXIX	2341	98	449.2	1.9	447.3	4.0	445.2	2.1	17.2	Syenite	1.9	17.2	15.3	17.9	3.4	Eluvial/Alluvial										
161	XXXIX	2340	98	450.0	2.5	447.5	9.0	441.0	6.5	20.1	Syenite	7.0	20.0	13.0	16.3	3.0	Eluvial/Alluvial										
162	XXXIX	3001	36	450.1	3.2	446.9	10.0	440.1	6.8	17.0	Syenite	3.2	16.7	13.5	17.3	3.5	Eluvial/Alluvial										
163	XXXIX	2339	160	450.1	3.1	447.0	11.0	439.1	7.9	19.0	Syenite	5.0	19.0	14.0	17.6	3.3	Eluvial/Alluvial										
164	XXXIX	2079	90	449.5	5.0	444.5	13.0	436.5	8.0	22.0	Syenite	13.0	17.0	4.0	11.8	2.1	Eluvial										
165	XXXIX	2338	115	448.8	6.0	442.8	24.4	424.4	18.4	26.0	Syenite	19.0	26.0	7.0	26.3	4.7	Eluvial/Alluvial										
166	XXXIX	2080	84	447.5	7.0	440.5	21.8	425.7	14.8	26.8	Syenite	15.0	24.0	9.0	23.0	4.8	Eluvial/Alluvial										
167	XXXIX	2337	114	446.2	4.0	442.2	15.7	430.5	11.7	20.2	Syenite	11.0	20.2	9.2	13.1	2.7	Eluvial/Alluvial										
168	XXXIX	2081	83	444.8	5.6	439.2	5.6	439.2		20.2	Syenite	5.6	8.0	2.4	10.6	2.3	Eluvial										
169	XXXIX	2336	114	442.6	3.6	439.0	3.6	439.0		14.1	Syenite	3.6	14.0	10.4	11.9	1.9	Eluvial										
170	XXXIX	2082	82	442.1	1.8	440.3	1.8	440.3		15.0	Syenite	1.8	14.7	12.9	10.7	2.1	Eluvial										
171	XXXIX	2335	110	441.2	1.5	439.7	10.0	431.2	8.5	17.6	Monzonite	8.2	17.5														







Appendix 2-9 Mineralogical Analysis of The Karatkel deposit

No.	LINE No.	DRILL HOLE No.	HOLE DISTANCE (m)	COLLAR ELEVATION (m)	QUARTZARY BASELINE			TERTIARY BASEMENT			TOTAL DEPTH OF HOLE (m)	BED ROCK LITHOLOGY	HEAVY MINERAL CONCENTRATION					HEAVY MINERAL CONCENTRATION (OVER 50kg/m <sup>2</sup> ILMENITE)					
					QUARTZARY DEPTH (m)	QUARTZARY RY BASE ELEVATION (m)	QUARTZARY RY DEPTH (m)	TERTIARY DEPTH (m)	TERTIARY BASE ELEVATION (m)	Tertiary thickness (m)			HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>2</sup> )	ZIRCON (kg/m <sup>2</sup> )	DEPOSIT TYPE	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>2</sup> )	ZIRCON (kg/m <sup>2</sup> )
331	XXXIII	2559	58	433.3	1.3	432.0	9.0	424.3	7.7	12.0	Gabbro	1.0	11.5	10.5	59.9	7.9	Eluvial/Alluvial	6.0	8.9	2.9	111.2	15.4	Alluvial
332	XXXIII	3469	42	434.0	4.0	430.0	13.2	420.8	9.2	18.5	Gabbro	5.0	18.5	13.5	34.1	3.8	Eluvial/Alluvial	9.0	13.1	4.1	68.3	9.1	Alluvial
333	XXXIII	2526	54	435.3	3.0	432.5	12.0	423.5	9.0	16.9	Gabbro	4.6	16.0	11.4	53.5	6.0	Eluvial/Alluvial	5.7	11.7	6.0	78.8	9.7	Alluvial
334	XXXIII	3470	52	436.8	4.0	432.8	12.3	424.5	8.3	23.0	Gabbro	9.0	22.5	13.5	47.7	6.9	Eluvial/Alluvial	11.3	19.2	7.9	56.2	9.0	Eluvial/Alluvial
335	XXXIII	2527	46	437.4	5.0	432.4	16.8	420.6	11.8	21.9	Gabbro	10.0	21.0	11.0	67.8	9.1	Eluvial/Alluvial	10.3	16.8	6.5	87.4	13.5	Alluvial
336	XXXIII	3772	50	437.7	5.8	431.9	19.7	418.0	13.9	19.9	Gabbro	8.0	19.7	11.7	60.0	9.4	Eluvial/Alluvial	12.1	18.3	6.2	87.9	14.0	Alluvial
337	XXXIII	2996	44	437.9	6.0	431.9	18.2	419.7	12.2	20.0	Gabbro	11.0	19.7	8.7	65.1	10.5	Eluvial/Alluvial	11.0	18.2	7.2	73.0	12.1	Alluvial
338	XXXIII	3471	44	438.2	6.1	432.1	20.0	418.2	13.9	23.0	Gabbro	11.8	21.5	9.7	37.7	5.9	Eluvial/Alluvial	15.5	19.9	4.4	58.0	9.2	Alluvial
339	XXXIII	3472	42	438.4	6.0	432.4	19.5	418.9	13.5	28.0	Gabbro	13.9	27.0	13.1	22.4	1.7	Eluvial/Alluvial	18.2	18.4	1.2	73.2	11.7	Alluvial
340	XXXIII	3473	44	438.5	6.0	432.5	18.6	419.9	12.6	33.0	Gabbro	11.8	32.0	20.2	18.0	2.4	Eluvial/Alluvial	17.6	18.4	0.8	61.4	7.9	Alluvial
341	XXXIII	2155	50	438.9	5.5	433.4	18.9	420.0	13.4	22.0	Gabbro	13.5	20.5	7.0	19.5	2.8	Eluvial/Alluvial						
342	XXXIII	2529	42	438.8	6.0	432.8	18.0	420.8	12.0	32.0	Gabbro	9.2	31.0	21.8	27.2	1.7	Eluvial/Alluvial						
343	XXXIII	3474	50	438.4	5.3	433.1	10.3	428.1	5.0	20.0	Gabbro	5.2	19.5	14.3	25.3	1.2	Eluvial/Alluvial						
344	XXXIII	3475	59	438.2	4.3	433.9	13.2	425.0	8.9	22.0	Gabbro	12.4	21.5	9.1	24.4	0.7	Eluvial/Alluvial						
345	XXXIII	2154	44	438.2	4.0	434.2	13.5	424.7	9.5	23.0	Gabbro	10.0	23.0	13.0	29.3	3.0	Eluvial/Alluvial						
346	XXXIII	3476	54	438.2	4.0	434.2	17.4	420.8	13.4	24.0	Gabbro	10.0	17.4	7.4	18.4	3.3	Eluvial/Alluvial						
347	XXXIII	3997	46	438.2	4.0	434.2	15.8	422.4	11.8	18.5	Gabbro	10.5	18.0	7.5	21.7	0.3	Eluvial/Alluvial						
348	XXXIII	3477	49	437.9	2.8	435.1	17.5	420.4	14.7	19.5	Gabbro	12.8	19.0	6.2	22.3	5.3	Eluvial/Alluvial						
349	XXXIII	2153	46	437.6	1.5	436.1	16.8	420.8	15.3	22.5	Gabbro	13.8	18.2	4.4	23.9	4.3	Eluvial/Alluvial						
350	XXXIII	3478	56	437.3	2.0	435.3	22.3	415.0	20.3	25.0	Gabbro	10.0	22.3	12.3	22.2	4.3	Eluvial/Alluvial						
351	XXXIII	3479	37	437.3	2.0	435.3	21.5	415.8	19.5	24.0	Gabbro	11.0	23.5	12.5	20.5	3.8	Eluvial/Alluvial						
352	XXXIII	3480	44	437.3	2.3	435.0	21.3	416.0	19.0	24.5	Gabbro	11.0	24.5	13.5	25.0	5.3	Eluvial/Alluvial						
353	XXXIII	2152	64	437.4	4.3	433.1	20.8	416.6	16.5	32.6	Gabbro	11.2	32.5	21.3	29.7	2.2	Eluvial/Alluvial						
354	XXXIII	3481	42	437.6	6.0	431.6	20.3	417.3	14.3	27.0	Gabbro	14.0	26.5	12.5	30.1	3.0	Eluvial/Alluvial						
355	XXXIII	2151A	60	439.0	9.0	430.0	17.8	421.2	8.8	21.1	Gabbro	10.1	21.0	11.0	59.0	0.2	Eluvial/Alluvial	13.9	19.8	5.9	72.5	0.2	Eluvial/Alluvial
356	XXXIII	3482	50	440.2	10.0	430.2	18.2	422.0	8.2	33.0	Gabbro	16.4	32.5	16.1	30.0	0.6	Eluvial/Alluvial						
357	XXXIII	2151	50	441.2	6.2	435.3	19.5	422.0	13.3	28.0	Syenite	14.0	28.0	14.0	43.6	1.8	Eluvial/Alluvial	21.2	25.2	4.0	62.9	0.3	Eluvial
358	XXXIII	3483	50	442.2	7.0	435.2	14.0	428.2	7.0	28.0	Gabbro	11.0	16.0	5.0	22.7	0.1	Eluvial/Alluvial						
359	XXXIII	2150A	50	442.6	8.0	434.6	12.0	430.6	4.0	29.0	Syenite	10.0	29.0	19.0	38.9	0.4	Eluvial/Alluvial	13.9	15.8	1.9	50.0	0.6	Eluvial
360	XXXIII	2150	96	441.8	7.0	434.8	10.2	431.6	3.2	29.0	Gabbro	7.0	16.0	9.0	22.7	1.4	Eluvial/Alluvial						
361	XXXIII	2149	200	438.9	4.9	434.0	4.9	434.0	4.9	23.1	Syenite	4.9	8.7	3.8	19.3	0.2	Eluvial/Alluvial						
362	XXXIII	2148	194	433.9	4.6	429.3	4.6	429.3	4.6	10.8	Syenite	4.6	10.8	6.2	14.0	1.8	Eluvial/Alluvial						
363	XXXIII	2147	396	433.5	6.8	426.7	6.8	426.7	6.8	7.5	Syenite						Eluvial/Alluvial						
364	XXXII	3658		435.0	6.2	428.8	6.2	428.8	6.2	15.0	Gabbro	12.0	14.5	2.5	22.3	0.2	Eluvial/Alluvial						
365	XXXII	2037	114	432.9	2.2	430.7	2.2	430.7	2.2	16.7	Gabbro	2.2	16.5	14.3	18.8	0.6	Eluvial/Alluvial						
366	XXXII	1236	214	433.4	3.0	430.4	3.6	429.8	0.6	8.0	Gabbro	3.0	8.0	5.0	25.4	2.3	Eluvial/Alluvial						
367	XXXII	3434	60	435.0	2.0	433.0	3.1	431.9	1.1	7.0	Gabbro	2.0	3.1	1.1	24.3	5.0	Eluvial/Alluvial						
368	XXXII	3435	48	436.0	2.0	434.0	5.3	430.7	3.3	7.5	Gabbro	2.0	5.3	3.3	38.2	6.2	Eluvial/Alluvial						
369	XXXII	3436	48	436.5	2.8	433.7	7.5	429.0	4.7	13.0	Gabbro	3.0	9.4	6.4	23.2	2.6	Eluvial/Alluvial						
370	XXXII	3437	52	436.7	4.0	432.7	9.2	427.5	5.2	14.5	Gabbro	9.5	11.0	1.5	26.1	2.1	Eluvial/Alluvial						
371	XXXII	2995	52	436.7	4.0	432.7	15.0	421.7	11.0	18.0	Gabbro	9.0	17.8	8.8	35.7	4.8	Eluvial/Alluvial	10.1	13.1	3.0	57.8	8.8	Alluvial
372	XXXII	3438	44	436.8	5.7	431.1	18.2	418.6	12.5	20.5	Gabbro	7.7	20.0	12.3	17.2	7.1	Eluvial/Alluvial	9.7	16.2	6.5	71.5	11.4	Alluvial
373	XXXII	3439	52	437.1	4.6	432.5	20.0	417.1	15.4	24.5	Gabbro	10.7	21.8	11.1	50.5	7.0	Eluvial/Alluvial	12.6	19.9	7.3	56.7	8.5	Alluvial
374	XXXII	3440	50	437.0	5.0	432.0	19.0	418.0	14.0	20.5	Gabbro	8.7	19.8	11.1	48.8	8.2	Eluvial/Alluvial	16.6	19.7	3.1	76.8	11.3	Eluvial/Alluvial
375	XXXII	3441	44	436.7	5.0	431.7	21.9	414.8	16.9	23.0	Gabbro	7.0	22.0	15.0	48.9	7.1	Eluvial/Alluvial	11.0	20.8	9.8	62.1	9.3	Alluvial
376	XXXII	3442	52	436.7	4.0	432.7	16.7	420.0	12.7	18.0	Gabbro	9.0	16.7	7.7	61.5	9.3	Eluvial/Alluvial	9.0	15.0	6.0	70.9	10.4	Alluvial
377	XXXII	3443	50	436.8	5.0	431.8	16.5	420.3	11.5	21.0	Gabbro	10.4	21.8	11.4	26.0	3.0	Eluvial/Alluvial	11.9	12.6	0.7	66.7	10.9	Alluvial
378	XXXII	3444	52	436.4	4.0	432.4	17.8	418.6	13.8	23.0	Gabbro	8.8	16.0	7.2	20.7	3.4	Eluvial/Alluvial	11.6	13.3	1.7	74.3	10.6	Alluvial
379	XXXII	3445	50	436.2	4.0	432.2	21.0	415.2	17.0	25.0	Gabbro	9.0	18.8	9.8	30.8	5.4	Eluvial/Alluvial						
380	XXXII	3446	50	436.5	3.5	433.0	18.0	418.5	14.5	24.0	Gabbro	9.0	20.0	11.0	22.2	4.1	Eluvial/Alluvial						
381	XXXII	3447	48	436.5	3.8	432.7	18.5	418.0	14.7	26.3	Gabbro	10.0	18.5	8.5	30.7	5.6	Eluvial/Alluvial						
382	XXXII	3448	48	436.7	3.9	432.8	21.0	415.7	17.1	26.0	Gabbro	10.2	25.4	15.2	19.8	4.1	Eluvial/Alluvial						
383	XXXII	3449	52	436.9	2.5	434.4	19.6	417.3	17.1	24.5	Gabbro	9.0	23.8	14.8	23.8	4.2	Eluvial/Alluvial						
384	XXXII	3450	50	436.9	1.0	435.9	20.0	416.9	19.0	27.7	Gabbro	9.1	27.0	17.9	20.7	3.6	Eluvial/Alluvial						
385	XXXII	3451	50	436.9	2.0	434.9	21.0	415.9	19.0	25.3	Gabbro	10.1	25.3	15.2	19.7	4.4	Eluvial/Alluvial						
386	XXXII	3452	50	436.9	2.0	434.9	19.9	417.0	17.9	24.0	Gabbro	9.8	22.0	12.2	20.8	4.3	Eluvial/Alluvial						
387	XXXII	3453	40	437.3	2.2	435.1	17.8	419.5	15.6	25.5	Gabbro	9.8	17.8	8.0	18.7	3.8	Eluvial/Alluvial						
388	XXXII	3454	52	437.4	2.3	435.1	15.0	422.4	12.7	25.3	Gabbro	9.0	25.0	16.0	29.6	1.3	Eluvial/Alluvial						
389	XXXII	3985	50	437.9	2.8	435.1	12.8	425.1	10.0	19.0	Gabbro	5.0	18.8	13.8	33.2	0.7	Eluvial/Alluvial						
390	XXXII	3455	42	439.0	4.0	435.0	11.4	427.6	7.4	26.4	Gabbro	10.0	26.0	16.0	28.1	1.3	Eluvial/Alluvial	12.9	18.6	5.7	51.5	0.2	Eluvial
391	XXXII	4017	58	440.3	4.0	436.3	10.0	430.3	6.0														



Appendix 2-9 Mineralogical Analysis of The Karatkel deposit

No.	LINE No.	DRILL HOLE No.	HOLE DISTANCE (m)	DOLLAR ELEVATION (m)	QUARTZARY (BASEMET)				TERTIARY BASEMENT		TOTAL DEPTH OF HOLE (m)	BED ROCK LITHOLOGY	HEAVY MINERAL CONCENTRATION				HEAVY MINERAL CONCENTRATION (OVER 50kg/m <sup>2</sup> ILMENITE)						
					QUARTZARY DEPTH (m)	QUARTZARY DEPTH (m)	QUARTZARY DEPTH (m)	QUARTZARY DEPTH (m)	TERTIARY DEPTH (m)	TERTIARY DEPTH (m)			HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>2</sup> )	ZIRCON (kg/m <sup>2</sup> )	DEPOSIT TYPE	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>2</sup> )	ZIRCON (kg/m <sup>2</sup> )
441	XXX	3389	48	433.4	3.4	430.0	6.4	427.0	3.0	13.0	Syenite	3.4	12.6	9.2	15.5	3.1	Eluvial/Alluvial						
442	XXX	3390	46	434.1	4.0	430.1	7.9	426.2	3.9	14.0	Syenite	4.0	12.0	8.0	23.4	3.9	Eluvial/Alluvial	7.3	7.8	0.5	61.1	11.7	Alluvial
443	XXX	3391	56	434.4	3.5	430.9	12.4	422.0	8.9	16.0	Syenite	3.5	15.0	11.5	18.6	2.9	Eluvial/Alluvial						
444	XXX	3392	44	434.6	3.0	431.6	14.9	419.7	11.9	17.0	Granite	3.0	17.0	14.0	18.0	2.8	Eluvial/Alluvial						
445	XXX	3393	58	434.6	3.0	431.6	19.0	415.6	16.0	20.0	Granite	3.0	19.0	16.0	31.3	4.9	Alluvial	13.3	15.3	2.0	53.0	9.1	Alluvial
446	XXX	3394	42	434.6	5.5	429.1	18.0	416.6	12.5	18.5	Granite	4.0	18.0	14.0	36.1	6.2	Alluvial	8.6	12.3	3.7	62.7	10.3	Alluvial
447	XXX	3395	56	434.7	3.0	431.7	15.0	418.7	12.0	17.0	Granite	3.0	13.7	10.7	18.5	4.0	Alluvial						
448	XXX	3396	49	434.6	5.3	429.3	16.2	418.4	10.9	16.5	Granite	9.0	16.2	7.2	24.1	5.2	Alluvial						
449	XXX	3397	50	434.4	5.0	429.4	13.2	421.2	8.2	14.0	Granite	4.0	13.2	9.2	27.3	5.0	Alluvial	7.0	7.7	0.7	50.6	12.0	Alluvial
450	XXX	3398	50	434.1	5.0	429.1	12.0	422.1	7.0	14.0	Granite	6.8	12.0	5.2	22.2	4.2	Alluvial						
451	XXX	3399	50	433.8	4.5	429.3	11.3	422.5	6.8	14.0	Granite	6.4	11.3	4.9	29.3	5.7	Alluvial	10.2	11.2	1.0	55.7	9.0	Alluvial
452	XXX	3400	52	433.6	4.3	429.3	9.7	423.9	5.4	11.7	Granite	9.7	9.7	9.7	19.0	4.1	Alluvial						
453	XXX	3401	46	433.3	4.0	429.3	8.0	425.3	4.0	12.5	Granite	4.0	8.0	4.0	16.3	3.9	Alluvial						
454	XXX	3402	48	433.2	4.0	429.2	9.5	423.7	5.5	12.0	Granite	4.0	12.0	8.0	17.6	5.1	Eluvial/Alluvial						
455	XXX	3403	48	433.3	4.0	429.3	6.8	426.5	2.8	9.6	Granite	4.0	6.8	2.8	25.7	6.6	Eluvial/Alluvial						
456	XXX	3404	54	433.3	5.0	428.3	5.0	428.3			Granite												
457	XXX	3405	46	433.7	4.8	428.9	4.8	428.9			Granite												
458	XXX	3406	48	434.2	4.4	429.8	4.4	429.8			Granite												
459	XXX	4018	62	434.3	3.0	431.3	3.0	431.3			Granite												
460	XXX	1194	50	435.2	3.0	432.2	3.0	432.2			Granite												
461	XXX	1195	48	435.4	3.7	431.7	3.7	431.7			Granite												
462	XXX	1196	100	436.0	5.0	431.0	5.0	431.0			Granite												
463	XXX	1197	95	436.4	5.3	431.1	5.3	431.1			Granite												
464	XXX	1198	98	436.8	6.0	430.8	6.0	430.8			Granite												
465	XXIX	1547	47	437.5	3.5	434.0	3.5	434.0			Syenite	3.5	8.0	4.5	13.6	3.1	Eluvial/Alluvial						
466	XXIX	1546	50	437.3	2.9	434.4	4.5	432.8	1.6	5.8	Syenite	2.9	5.3	2.4	6.4	1.5	Eluvial/Alluvial						
467	XXIX	1545	50	436.9	3.6	433.3	4.5	432.4	0.9	6.0	Syenite	3.6	6.0	2.4	13.8	3.9	Eluvial/Alluvial						
468	XXIX	1401	47	436.6	3.8	432.8	6.0	430.6	2.2	8.0	Syenite	3.8	8.0	4.2	17.3	3.8	Eluvial/Alluvial						
469	XXIX	1402	52	436.4	5.5	430.9	12.0	424.4	6.5	13.5	Syenite	6.0	13.0	7.0	14.3	2.5	Eluvial/Alluvial						
470	XXIX	1403	45	436.2	5.0	431.2	15.0	421.2	10.0	15.6	Syenite	6.0	15.6	9.6	37.2	6.0	Eluvial/Alluvial	11.1	13.3	2.2	55.7	9.9	Alluvial
471	XXIX	1404	52	435.7	4.0	431.7	18.0	417.7	14.0	18.0	Syenite	7.0	18.0	11.0	47.9	7.9	Eluvial/Alluvial	10.8	14.8	4.0	74.8	12.2	Alluvial
472	XXIX	1405	52	435.4	4.0	431.4	17.2	418.2	13.2	17.2	Granite	4.0	17.1	13.1	43.3	7.2	Eluvial/Alluvial	9.8	15.9	6.2	61.7	10.9	Alluvial
473	XXIX	1406	53	434.8	5.0	429.8	17.5	417.3	12.5	17.5	Granite	7.0	17.5	10.5	49.5	10.2	Eluvial/Alluvial	8.8	15.7	6.9	50.5	10.0	Alluvial
474	XXIX	1407	44	434.5	4.8	429.7	16.0	418.5	11.2	16.0	Granite	7.0	16.0	9.0	31.9	5.9	Eluvial/Alluvial						
475	XXIX	1408	49	434.0	5.9	428.1	12.7	421.3	6.8	12.7	Granite	7.0	12.7	5.7	41.8	8.4	Eluvial/Alluvial	11.9	12.7	0.8	59.6	12.2	Alluvial
476	XXIX	1409	50	433.5	4.7	428.8	9.6	423.9	4.9	10.2	Granite	4.7	9.6	4.9	31.8	6.6	Eluvial/Alluvial						
477	XXIX	1410	47	433.3	4.8	428.5	8.5	424.8	3.7	9.2	Granite	4.8	8.4	3.6	18.8	4.0	Eluvial/Alluvial						
478	XXIX	1411	50	433.2	4.5	428.7	8.5	424.7	4.0	9.5	Granite	4.5	8.5	4.0	23.8	5.6	Eluvial/Alluvial						
479	XXIX	1412	48	433.2	6.0	427.2	9.0	424.2	3.0	14.0	Granite	6.0	9.0	3.0	31.5	8.4	Eluvial/Alluvial						
480	XXIX	1413	54	432.7	5.3	427.4	7.7	425.0	2.4	8.0	Granite	5.3	7.7	2.4	19.5	5.3	Eluvial/Alluvial						
481	XXIX	1414	45	432.3	2.9	428.4	5.0	427.3	2.1	7.0	Granite	2.9	6.0	3.1	22.9	5.8	Eluvial/Alluvial						
482	XXIX	1415	48	431.9	3.4	428.5	3.4	428.5			Granite												
483	XXIX	1416	47	431.8	4.5	427.3	4.5	427.3			Granite												
484	XXIX	1417	48	431.8	5.3	426.5	5.3	426.5			Granite												
485	XXIX	1418	50	431.9	4.5	427.4	4.5	427.4			Granite	3.0	5.0	2.0	9.5	2.2	Eluvial/Alluvial						
486	XXIX	1896	148	433.9	2.5	431.4	2.5	431.4			Granite												
487	XXIX	1895	186	436.3	5.0	431.3	5.0	431.3			Granite												
488	XXIX	1894	406	431.4	0.7	430.7	0.7	430.7			Syenite	0.7	14.8	14.1	20.4	0.7	Eluvial/Alluvial						
489	XXIX	1893	186	429.2	3.2	426.0	3.2	426.0			Syenite	3.0	5.0	2.0	14.3	1.5	Eluvial/Alluvial						
490	XXIX	1892	194	429.6	3.5	426.1	3.5	426.1			Syenite												
491	XXIX-A	3780		438.8		438.8		438.8			Syenite	2.0	7.0	5.0	11.1	2.9	Eluvial/Alluvial						
492	XXIX-A	3781	60	438.3	3.0	435.3	3.0	435.3			Syenite	3.0	7.0	4.0	12.0	2.8	Eluvial						
493	XXIX-A	3782	50	438.2	3.8	434.4	3.8	434.4			Syenite	6.0	8.8	2.8	10.3	2.4	Eluvial						
494	XXIX-A	3783	50	437.8	5.0	432.8	7.0	430.8			Syenite	5.1	9.5	4.4	58.0	8.3	Eluvial/Alluvial	5.1	7.1	2.0	98.4	13.1	Alluvial
495	XXIX-A	2063	49	437.7	8.0	429.7	9.5	428.2	1.5	14.7	Granite	8.0	14.5	6.5	14.2	2.1	Eluvial/Alluvial						
496	XXIX-A	3379	50	437.6	7.0	430.6	7.0	430.6			Granite												
497	XXIX-A	2983	49	437.4	7.5	429.9	7.5	429.9			Granite												
498	XXIX-A	3380	48	437.0	6.0	431.0	7.0	430.0	1.0	12.5	Granite												
499	XXIX-A	2064	50	436.1	5.0	431.1	13.5	422.6	8.5	14.0	Granite	5.0	13.5	8.5	18.7	2.5	Alluvial						
500	XXIX-A	3381	48	435.2	5.0	430.2	17.5	417.7	12.5	18.0	Granite	6.0	17.5	11.5	32.5	5.7	Alluvial	14.0	16.0	2.0	53.6	8.6	Alluvial
501	XXIX-A	2384	49	434.5	5.0	429.5	14.9	419.6	9.9	16.0	Granite	5.0	14.9	9.9	39.9	7.4	Alluvial	11.0	12.8	1.8	68.1	11.6	Alluvial
502	XXIX-A	3382	50	433.6	4.2	429.4	16.0	417.6	11.8	17.0	Granite	5.6	16.0	10.4	35.1	6.7	Alluvial	11.1	13.1	2.0	58.4	10.2	Alluvial
503	XXIX-A	2065	52	432.8	3.6	429.2	12.8	420.0	9.2	13.8	Granite	4.0	12.8	8.8	27.7	4.7	Alluvial						
504	XXIX-A	3383	51	432.2	4.2	428.0	17.0	415.2	12.8	18.0	Granite	4.2	17.0	12.8	20.2	3.5	Alluvial						
505	XXIX-A	3384	102	431.7	3.8	427.9	9.3	422.4	5.5	18.0	Granite	3.8	7.2	3.4	26.2	6.1	Alluvial						
506	XXIX-A	2066	51	431.8	4.0	427.8	16.8	415.0	12.8	20.5	Granite	4.0	7.1	3.1	28.1	6.8	Alluvial						
507	XXIX-A	3385	50	431.6	3.2	428.4	12.1	419.5	8.9	21.0	Granite	3.2	5.0	1.8	39.1	8.3	Alluvial	3.1	4.1	1.0	55.1		







Appendix 2-9 Mineralogical Analysis of The Karotkel deposit

No.	LINE No.	DRILL HOLE No.	HOLE DISTANCE (m)	COLLAR ELEVATION (m)	QUATERNARY BASEMENT				TERTIARY BASEMENT			TOTAL DEPTH OF HOLE (m)	BED ROCK LITHOLOGY	HEAVY MINERAL CONCENTRATION					HEAVY MINERAL CONCENTRATION (OVER 50kg/m <sup>3</sup> ILMENITE)				
					QUATERNARY DEPTH (m)	QUATERNARY BY BASE ELEVATION (m)	TERTIARY DEPTH (m)	TERTIARY BY BASE ELEVATION (m)	Tertiary Thickness (m)	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)			Ore Thickness (m)	ILMENITE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )	DEPOSIT TYPE	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )	DEPOSIT TYPE
661	XXIV	3293	48	435.5	4.2	431.3	12.3	423.2	8.1	12.4	Granite	4.2	12.3	8.1	76.3	13.7	Alluvial	7.5	12.4	4.9	104.1	96.7	Alluvial
662	XXIV	3711	46	434.3	3.8	430.5	12.2	422.1	8.4	12.2	Granite	3.8	12.2	8.4	58.2	11.4	Alluvial	8.0	10.0	2.0	114.1	21.9	Alluvial
663	XXIV	3294	54	433.6	3.0	430.6	5.0	428.6	2.0	12.8	Granite	1.5	12.0	10.5	46.2	8.8	Alluvial	7.1	12.0	4.9	73.6	13.6	Alluvial
664	XXIV	3712	46	433.4	3.0	430.4	12.8	420.6	9.8	12.8	Granite	3.0	12.8	9.8	39.3	9.0	Alluvial	9.0	12.7	3.7	61.4	15.8	Alluvial
665	XXIV	3295	42	433.3	3.0	430.3	14.3	419.0	11.3	14.7	Granite	0.3	12.6	12.3	35.0	7.0	Alluvial	7.2	8.7	1.5	51.2	8.6	Alluvial
666	XXIV	3296	50	433.3	6.0	427.3	14.3	419.0	8.3	14.7	Granite	5.0	14.3	9.3	38.6	6.9	Alluvial	6.1	10.1	4.0	52.7	9.8	Alluvial
667	XXIV	3297	48	432.9	5.3	427.6	14.0	418.9	8.7	16.5	Granite	4.4	16.0	11.6	60.4	7.6	Alluvial	7.4	9.4	2.0	52.1	10.5	Alluvial
668	XXIV	3298	54	433.1	7.0	426.1	15.9	417.2	8.9	17.3	Granite	0.3	15.9	15.6	31.0	6.5	Alluvial	9.0	10.9	1.9	55.6	10.5	Alluvial
669	XXIV	3194	46	432.7	5.5	427.2	15.1	417.6	9.6	15.4	Granite	4.5	15.3	10.8	31.1	5.4	Alluvial	9.6	11.8	2.0	58.8	9.1	Alluvial
670	XXIV	3299	50	432.3	2.0	430.3	14.2	418.1	12.2	14.2	Granite	2.0	12.2	10.2	29.0	4.6	Alluvial	8.2	10.1	1.9	56.2	7.6	Alluvial
671	XXIV	3300	45	431.6	3.0	428.6	9.0	422.6	6.0	15.0	Granite	3.0	9.0	6.0	37.0	6.3	Alluvial						
672	XXIV	3301	55	431.2	1.0	430.2	12.8	418.4	11.8	15.1	Granite	0.4	12.8	12.4	29.1	5.0	Alluvial	0.4	1.5	1.1	50.7	18.8	Alluvial
673	XXIV	3302	49	431.0	3.0	428.0	8.7	423.3	5.7	11.6	Granite	3.0	8.7	5.7	19.0	3.2	Alluvial						
674	XXIV	3303	52	430.3	2.6	427.7	6.0	424.3	3.4	14.1	Granite	2.6	6.0	3.4	27.6	5.1	Alluvial						
675	XXIV	3304	40	430.1	4.0	426.1	6.1	424.0	2.1	18.5	Granite	4.0	6.1	2.1	40.3	6.9	Alluvial						
676	XXIV	3305	49	429.3	4.0	425.3	7.5	421.8	3.5	12.0	Granite	2.0	7.5	5.5	20.5	3.6	Alluvial						
677	XXIV	1157	48	428.9	4.0	424.9	4.0	424.9		10.0	Granite	4.0	5.0	1.0	48.0	7.0	Alluvial						
678	XXIV	3306	52	428.1	4.0	424.1	4.0	424.1		16.0	Granite												
679	XXIV	1158	48	426.9	3.7	423.2	3.7	423.2		11.0	Granite												
680	XXIV	3307	54	426.5	2.0	424.5	4.9	421.6	2.9	10.2	Granite	2.0	4.9	2.9	13.3	1.6	Evapor/Alluvial						
681	XXIV	1159	48	425.9	3.2	422.7	3.2	422.7		8.6	Granite												
682	XXIV	3308	50	425.9	3.9	422.0	3.9	422.0		7.4	Granite												
683	XXIV	220	50	426.3	3.2	423.1	3.2	423.1		15.0	Granite	9.0	11.0	2.0	21.3	1.4	Eluvial						
684	XXIV	3309	48	426.1	3.8	422.3	3.8	422.3		10.6	Granite												
685	XXIV	1160	51	426.0	3.4	422.6	3.4	422.6		10.0	Granite												
686	XXIV	3310	51	426.1	4.9	421.2	4.9	421.2		10.0	Granite												
687	XXIV	1161	47	425.9	4.0	421.9	4.0	421.9		11.0	Granite	3.0	4.9	1.9	17.8	2.3	Alluvial						
688	XXIV	3311	62	425.6	4.2	421.4	4.2	421.4		15.0	Granite												
689	XXIV	1162	45	425.5	3.4	422.1	3.4	422.1		6.0	Granite												
690	XXIV	413	83	426.5	2.0	424.5	3.4	423.1	1.4	7.7	Granite												
691	XXIV	4560	96	427.5	3.8	423.7	6.1	421.4	2.3	17.8	Granite	3.8	6.1	2.3	38.1	8.3	Alluvial						
692	XXIV	4559	92	428.2	2.0	426.4	8.7	419.7	6.7	18.0	Granite	3.4	8.7	5.3	36.2	8.2	Alluvial						
693	XXIV	4508	96	428.7	2.5	426.2	7.0	421.7	4.5	7.5	Granite	3.8	7.0	3.2	26.6	6.6	Alluvial						
694	XXIV	414	94	429.2	5.3	423.9	5.3	423.9		7.6	Granite												
695	XXIV	4511	88	428.5	6.2	422.3	6.2	422.3		20.0	Granite												
696	XXIV	415	328	425.6	6.7	418.9	6.7	418.9		12.0	Granite												
697	XXIV	416	370	423.5	6.5	417.0	6.5	417.0		8.4	Syenite												
698	XXIV	417	448	424.0	6.8	417.2	6.8	417.2		7.2	Gabbro												
699	XXIII	1781		441.6	6.0	435.6	16.0	425.6	10.0	23.0	Granite												
700	XXIII	2403	67	442.4	6.5	435.9	17.0	425.4	10.5	24.7	Granite	6.5	17.0	10.5	24.0	5.5	Alluvial	14.4	16.9	2.5	61.2	14.6	Alluvial
701	XXIII	1870	50	443.2	5.0	438.2	12.0	431.2	7.0	18.0	Granite	5.0	12.0	7.0	16.5	2.4	Alluvial						
702	XXIII	3269	56	442.8	10.0	432.8	16.2	426.6	6.2	19.6	Granite	10.0	14.0	4.0	15.6	3.4	Alluvial						
703	XXIII	2404	50	442.0	11.8	430.2	17.0	425.0	5.2	27.7	Granite	11.8	17.0	5.2	25.7	7.0	Alluvial						
704	XXIII	3270	37	441.7	10.0	431.7	13.5	428.2	3.5	21.0	Granite	11.0	13.5	2.5	32.6	6.0	Alluvial						
705	XXIII	1869	68	439.7	8.2	431.5	11.5	428.2	3.3	18.2	Granite	4.0	11.5	7.5	18.2	12.8	Alluvial						
706	XXIII	3271	50	438.2	8.0	430.2	12.5	425.7	4.5	18.5	Granite	10.0	12.5	2.5	18.5	3.3	Alluvial						
707	XXIII	2405	50	431.7	6.8	424.9	11.6	420.1	4.8	16.0	Granite	6.8	11.6	4.8	44.9	10.5	Alluvial	11.0	11.9	0.9	69.1	16.9	Alluvial
708	XXIII	3272	48	436.7	7.9	428.8	12.0	424.7	4.1	19.0	Granite	7.9	12.0	4.1	30.7	6.9	Alluvial						
709	XXIII	1868	55	434.6	4.0	430.6	13.0	421.6	9.0	13.5	Granite	4.0	13.0	9.0	21.9	3.4	Alluvial						
710	XXIII	3273	50	436.0	4.5	431.5	10.3	425.7	5.8	14.5	Granite	4.5	10.3	5.8	35.4	7.6	Alluvial	8.1	10.5	2.4	55.3	6.2	Alluvial
711	XXIII	2406	50	435.5	5.1	430.4	8.5	427.0	3.4	18.7	Granite	5.1	8.5	3.4	38.2	8.1	Alluvial						
712	XXIII	3274	46	434.7	5.7	429.0	9.0	425.7	3.3	14.0	Granite	5.7	9.0	3.3	33.7	9.2	Alluvial	7.9	9.3	1.4	53.5	9.4	Alluvial
713	XXIII	1867	48	434.2	4.5	429.7	9.0	425.2	4.5	18.5	Granite	1.0	9.0	8.0	37.5	10.6	Alluvial	4.6	9.3	4.7	61.5	17.3	Alluvial
714	XXIII	3275	50	433.4	3.0	430.4	12.0	421.4	9.0	14.0	Granite	3.0	12.0	9.0	35.3	7.3	Alluvial	7.0	8.6	1.6	52.6	11.0	Alluvial
715	XXIII	2407	52	432.8	3.9	428.9	13.3	419.5	9.4	13.8	Granite	3.9	13.3	9.4	36.6	5.9	Alluvial	7.1	9.1	2.0	52.5	8.9	Alluvial
716	XXIII	3276	50	432.5	3.0	429.5	12.2	420.3	9.2	15.5	Granite	3.0	12.2	9.2	39.4	8.4	Alluvial	10.2	12.4	2.2	51.2	13.1	Alluvial
717	XXIII	1866	50	432.7	3.0	429.7	9.0	423.7	6.0	13.7	Granite	3.0	9.0	6.0	26.8	4.1	Alluvial	8.2	10.3	2.1	52.6	9.9	Alluvial
718	XXIII	3277	48	431.7	4.3	427.4	12.4	419.3	8.1	12.5	Granite	4.3	12.4	8.1	34.1	6.9	Alluvial						
719	XXIII	3278	54	431.3	3.8	427.5	14.2	417.1	10.4	15.0	Granite	3.8	14.7	10.9	55.5	6.9	Alluvial						
720	XXIII	3279	50	431.2	3.7	427.5	14.2	417.0	10.5	14.3	Granite	3.7	14.2	10.5	42.5	8.1	Alluvial						
721	XXIII	3788	50	431.2	5.0	426.2	13.3	417.9	8.3	14.5	Granite	5.0	13.3	8.3	26.0	5.4	Alluvial						
722	XXIII	3280	48	431.4	4.0	427.4	11.7	419.7	7.7	11.7	Granite	4.2	11.7	7.5	36.5	7.7	Alluvial						
723	XXIII	2409	50	431.6	3.0	428.6	11.9	419.7	8.9	17.0	Granite	3.0	11.9	8.9	37.7	6.5	Alluvial	10.1	12.0	1.9	65.0	9.0	Alluvial
724	XXIII	3281	48	431.3	4.0	427.3	8.8	422.5	4.8	11.2	Granite	4.0	8.8	4.8	34.1	7.7	Alluvial						
725	XXIII	1864	48	430.3	3.0	427.3	5.0	425.3	2.0	11.0	Granite	3.0	5.0	2.0	1.0	0.5	Alluvial						
726	XXIII	3282	50	429.1	3.5	425.6	9.0	420.1	5.5	18.7	Granite	3.3	9.0	5									



Appendix 2-9 Mineralogical Analysis of The Karotkel deposit

No.	LINE No.	DRILL HOLE No.	HOLE DISTANCE (m)	COLLAR ELEVATION (m)	QUARTZITE - BASEMENT					TOTAL DEPTH OF HOLE (m)	BED ROCK LITHOLOGY	HEAVY MINERAL CONCENTRATION					HEAVY MINERAL CONCENTRATION (OVER 50kg/m <sup>2</sup> ILMENITE)						
					QUARTZITE DEPTH (m)	QUARTZITE BY BASE ELEVATION (m)	TERTIARY DEPTH (m)	TERTIARY BY BASE ELEVATION (m)	TERTIARY INCLINE (m)			HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )	DEPOSIT TYPE	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )	DEPOSIT TYPE
771	XXII	3256	50	428.9	3.0	428.9	8.5	420.4	5.5	30.5	Granite	3.0	8.5	5.5	35.4	8.2	Alluvial						
772	XXII	3257	52	428.5	3.0	428.5	11.0	417.5	8.0	20.8	Granite	3.0	8.8	5.8	28.3	5.7	Alluvial						
773	XXII	3258	50	428.2	5.4	422.8	9.3	418.9	3.9	27.0	Granite	5.0	9.3	4.3	32.8	6.0	Alluvial						
774	XXII	3259	50	427.9	4.5	423.4	9.1	418.8	4.6	29.0	Granite	4.5	9.1	4.6	24.3	8.0	Alluvial						
775	XXII	1139	50	427.6	3.6	424.0	8.3	419.3	4.7	22.0	Granite	3.6	10.0	6.4	31.4	6.2	Alluvial	6.8	8.5	1.7	64.7	11.4	Alluvial
776	XXII	3260	52	427.3	3.8	423.5	5.7	421.6	1.9	12.0	Granite	3.8	7.0	3.2	17.4	3.8	Alluvial						
777	XXII	1140	50	426.9	2.5	424.4	6.7	420.2	4.2	23.3	Granite	2.5	10.0	7.5	27.9	5.1	Alluvial	6.9	7.8	0.9	67.5	11.0	Alluvial
778	XXII	3261	44	426.5	4.1	422.4	4.8	421.7	0.7	17.1	Granite	4.1	6.0	1.9	31.5	6.4	Alluvial	3.9	4.9	1.0	66.2	12.3	Alluvial
779	XXII	3262	50	426.0	4.5	421.5	5.8	420.2	1.3	14.0	Granite	4.5	5.8	1.3	1.4	0.7	Alluvial						
780	XXII	3263	62	424.9	4.0	420.9	5.5	419.4	1.5	12.0	Granite	4.0	5.5	1.5	15.7	3.4	Alluvial						
781	XXII	3264	68	424.5	3.8	420.7	5.2	419.3	1.4	11.5	Granite	3.8	5.2	1.4	30.6	7.1	Alluvial						
782	XXII	1143	66	425.0	3.9	421.1	6.0	419.0	2.1	11.5	Granite	3.9	6.0	2.1	16.9	3.4	Alluvial						
783	XXII	3265	50	424.7	3.1	421.6	4.3	420.4	1.2	10.7	Granite	3.1	4.3	1.2	15.9	3.6	Alluvial						
784	XXII	1144	50	424.3	3.2	421.1	5.5	418.8	2.3	11.0	Granite	3.2	6.6	3.4	31.0	5.7	Alluvial	4.1	5.1	1.0	51.1	6.1	Alluvial
785	XXII	3266	50	423.9	3.3	420.6	5.8	418.1	2.5	10.0	Granite	3.3	5.8	2.5	25.8	5.5	Alluvial						
786	XXII	1145	50	423.6	1.7	421.9	5.4	418.2	3.7	12.5	Granite	1.7	5.4	3.7	27.7	5.7	Alluvial	3.2	4.3	1.1	54.5	10.6	Alluvial
787	XXII	3267	50	423.5	3.0	420.5	5.7	417.8	2.7	8.0	Granite	3.0	5.7	2.7	21.8	2.2	Alluvial						
788	XXII	1146	50	423.5	3.0	420.5	3.0	420.5			9.2	Granite											
789	XXII	3268	48	423.4	3.9	419.5	3.9	419.5			14.0	Granite											
790	XXI	1779		443.6	8.0	435.6	8.0	435.6			18.0	Granite											
791	XXI	2413	64	443.2	6.0	437.2	9.3	433.9	3.3	16.0	Granite	6.0	7.8	1.8	9.7	2.8	Alluvial						
792	XXI	3171	38	442.8	7.5	435.3	8.2	434.6	0.7	19.5	Granite	2.5	4.0	1.5	11.2	1.8	Alluvial						
793	XXI	3172	102	441.9	9.0	432.9	9.5	432.4	0.5	18.0	Granite												
794	XXI	2414	58	441.2	9.0	432.2	9.0	432.2			10.2	Granite											
795	XXI	3173	47	440.8	8.0	432.8	8.5	432.3	0.5	14.8	Granite	2.0	4.0	2.0	9.4	2.7	Alluvial						
796	XXI	1856	40	440.3	6.0	434.3	16.0	424.3	10.0	17.5	Granite												
797	XXI	3174	58	439.6	7.7	431.9	12.0	427.6	4.3	12.8	Granite	7.3	7.7	0.4	11.9	4.2	Alluvial						
798	XXI	2415	57	438.8	6.0	432.8	12.3	426.5	6.3	13.4	Granite												
799	XXI	3175	44	438.3	7.0	431.3	12.2	426.1	5.2	13.3	Granite												
800	XXI	1855	40	437.7	4.5	433.2	13.5	424.2	9.0	16.5	Granite	8.5	13.5	5.0	4.9	3.2	Alluvial						
801	XXI	3176	58	437.2	6.8	430.4	14.5	422.7	7.7	20.4	Granite	12.8	14.5	1.7	8.7	4.0	Alluvial						
802	XXI	2416	52	436.6	7.0	429.5	15.0	421.6	8.0	18.2	Granite	13.0	15.0	2.0	21.8	5.4	Alluvial						
803	XXI	3177	48	435.8	4.5	431.3	12.4	423.4	7.8	15.1	Granite	10.0	12.4	2.4	11.2	4.0	Alluvial						
804	XXI	3178	44	435.1	5.2	429.9	11.0	424.1	5.8	12.5	Granite	7.3	11.0	3.7	14.5	4.7	Alluvial						
805	XXI	3179	52	434.1	5.0	429.1	7.8	426.3	2.8	10.5	Granite	5.1	8.0	2.9	20.4	5.0	Alluvial	7.2	7.8	0.6	53.3	11.9	Alluvial
806	XXI	3180	52	433.5	5.0	428.5	8.9	424.6	3.9	11.7	Granite	2.0	8.9	6.9	14.7	4.0	Alluvial						
807	XXI	3181	48	432.9	6.2	428.7	10.3	422.6	4.1	14.3	Granite	2.9	10.3	7.4	25.5	5.3	Alluvial	6.9	8.0	1.1	62.9	13.3	Alluvial
808	XXI	1853	48	432.9	6.0	426.9	13.0	419.9	7.0	16.5	Granite	6.0	16.5	10.5	16.4	3.1	Alluvial						
809	XXI	3182	42	431.3	6.1	425.2	13.0	418.3	6.9	14.2	Granite	6.1	13.0	6.9	32.9	6.9	Alluvial	6.3	6.7	0.4	62.9	9.6	Alluvial
810	XXI	2418	44	430.7	4.4	426.3	12.4	418.3	8.0	15.2	Granite	4.4	12.4	8.0	33.6	5.7	Alluvial						
811	XXI	3183	50	430.5	2.5	427.5	11.8	418.2	9.3	12.8	Granite	2.5	11.8	9.3	30.3	6.7	Alluvial						
812	XXI	1852	50	429.5	2.5	427.0	13.0	416.5	10.5	13.3	Granite	2.5	13.0	10.5	43.3	7.5	Alluvial	6.0	13.0	7.0	50.6	9.1	Alluvial
813	XXI	3184	50	429.0	8.0	428.2	13.0	416.0	12.2	14.0	Granite	0.8	13.0	12.2	25.3	5.2	Alluvial	6.7	7.4	0.7	52.1	8.9	Alluvial
814	XXI	2419	48	428.8	2.3	426.5	14.0	414.8	11.7	14.7	Granite	2.3	14.0	11.7	37.0	6.6	Alluvial	9.9	12.0	2.1	61.3	10.3	Alluvial
815	XXI	3185	50	428.9	3.7	425.2	14.0	414.9	10.3	15.0	Granite	3.7	14.0	10.3	32.5	6.3	Alluvial						
816	XXI	4164	48	428.8	3.9	424.9	14.3	414.5	10.4	15.0	Granite	3.9	14.8	10.9	34.3	5.8	Alluvial	6.3	8.5	2.2	57.0	9.6	Alluvial
817	XXI	3187	52	428.5	3.0	425.5	15.5	413.0	12.5	16.0	Granite	3.0	15.5	12.5	27.2	5.1	Alluvial						
818	XXI	2420	48	428.1	4.4	423.7	19.0	409.1	14.6	19.5	Granite	4.4	19.0	14.6	24.7	4.2	Alluvial						
819	XXI	3188	54	427.5	2.0	425.5	16.0	411.5	14.0	18.0	Granite	2.0	16.0	14.0	36.6	7.2	Alluvial						
820	XXI	1850	50	427.0	0.6	428.4	15.0	412.0	14.4	16.4	Granite	0.6	15.0	14.4	18.1	3.9	Alluvial	12.9	14.9	2.0	50.4	7.6	Alluvial
821	XXI	3189	50	426.6	1.5	425.1	13.7	412.9	12.2	16.0	Granite	4.5	13.7	9.2	26.0	5.3	Alluvial						
822	XXI	2421	48	426.5	3.0	423.5	12.2	414.3	9.2	22.4	Granite	3.0	7.0	4.0	21.5	4.2	Alluvial						
823	XXI	3190	52	426.2	2.0	424.2	12.0	414.2	10.0	15.0	Granite	2.0	12.0	10.0	23.0	5.0	Alluvial						
824	XXI	1849	50	425.9	4.0	421.9	12.0	413.9	8.0	15.8	Granite	4.0	12.0	8.0	11.9	2.5	Alluvial						
825	XXI	3191	52	425.4	4.3	421.1	11.8	413.6	7.5	14.3	Granite	2.2	11.8	9.6	18.5	3.7	Alluvial						
826	XXI	4062	25	425.3	3.8	421.5	8.4	416.9	4.6	10.7	Granite	3.8	8.0	4.2	36.5	7.5	Alluvial						
827	XXI	2422	20	425.2	3.5	421.7	10.0	415.2	6.5	18.0	Granite	3.9	10.0	6.1	27.7	5.6	Alluvial						
828	XXI	4061	23	425.1	3.5	421.6	6.9	418.2	3.4	9.5	Granite	3.5	6.9	3.4	23.0	4.7	Alluvial						
829	XXI	3192	26	424.7	3.9	420.8	9.8	414.9	5.9	16.0	Granite	3.9	9.8	5.9	28.9	5.1	Alluvial	8.0	9.8	1.8	52.8	8.7	Alluvial
830	XXI	4060	26	424.5	3.3	421.2	6.4	418.1	3.1	9.9	Granite	3.3	6.4	3.1	34.9	6.3	Alluvial						
831	XXI	1848	24	424.3	3.5	420.8	7.0	417.3	3.5	15.2	Granite	3.5	10.0	6.5	23.8	2.7	Alluvial						
832	XXI	4059	26	424.1	4.3	419.8	5.9	418.2	1.6	10.0	Granite	4.3	5.9	1.6	41.9	7.8	Alluvial						
833	XXI	3193	22	423.9	2.0	421.9	6.3	417.6	4.3	16.6	Granite	2.0	6.8	4.8	18.6	3.5	Alluvial						
834	XXI	4058	26	424.1	4.2	419.9	7.3	416.8	3.1	10.0	Granite	4.2	7.3	3.1	39.3	6.5	Alluvial						
835	XXI	2423	26	424.2	3.7	420.5	6.7	417.5	3.0	14.2	Granite	2.7	6.7	4.0	25.0	5.0	Alluvial						
836	XXI	4057	38	424.0	4.0	420.0	7.5	416.5	3.5	13.0</													



Appendix 2-9 Mineralogical Analysis of The Karatkel deposit

No.	LINE No.	DRILL HOLE No.	HOLE DISTANCE (m)	COLLAR ELEVATION (m)	QUATERNARY BASEMENT			TERTIARY BASEMENT			TOTAL DEPTH OF HOLE (m)	BED ROCK LITHOLOGY	HEAVY MINERAL CONCENTRATION					HEAVY MINERAL CONCENTRATION (OVER 80kg/m <sup>3</sup> ILMENITE)					
					QUATERNARY ART DEPTH (m)	QUATERNARY BY BASE ELEVATION (m)	QUATERNARY V. DEPTH (m)	TERTIARY V. DEPTH (m)	TERTIARY BASE ELEVATION (m)	Tertiary thickness (m)			HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )	DEPOSIT TYPE	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )
881	XX	3215	49	427.4	4.5	422.9	15.0	412.4	10.5	21.0	Granite	4.5	15.0	10.5	37.4	7.4	Alluvial	8.5	9.5	1.0	55.4	8.8	Alluvial
882	XX	3216	50	427.1	3.8	423.3	14.0	413.1	10.2	20.3	Granite	4.0	14.0	10.0	28.5	5.4	Alluvial						
883	XX	3217	50	426.8	3.7	423.1	14.0	412.8	10.3	17.0	Granite	3.7	14.0	10.3	32.7	6.3	Alluvial						
884	XX	3218	49	426.4	5.0	421.4	13.8	412.6	8.8	15.8	Granite	5.0	13.8	8.8	29.1	5.3	Alluvial						
885	XX	3219A	48	426.1	3.0	423.1	12.0	414.1	9.0	14.0	Granite	3.5	12.0	8.5	16.1	3.4	Alluvial						
886	XX	3219	49	425.5	3.5	422.0	12.0	413.5	8.5	18.5	Granite	3.5	12.0	8.5	24.3	4.2	Alluvial						
887	XX	4048	28	425.4	3.0	422.4	11.6	413.8	8.6	14.0	Granite	3.5	11.6	8.1	13.0	2.5	Alluvial						
888	XX	3220	24	425.3	5.0	420.3	11.6	413.7	6.6	13.7	Granite	5.0	11.6	6.6	15.1	2.9	Alluvial						
889	XX	4047	24	425.2	4.0	421.2	10.9	414.3	6.9	13.0	Granite	4.0	10.9	6.9	15.8	3.3	Alluvial						
890	XX	3221	24	425.0	4.5	420.5	8.2	416.8	3.7	16.2	Granite	4.5	8.2	3.7	22.8	5.3	Alluvial						
891	XX	4046	28	424.8	3.7	421.1	7.5	417.3	3.8	9.5	Granite	3.7	7.2	3.5	36.9	8.2	Alluvial						
892	XX	3222	23	424.7	4.0	420.7	7.6	417.1	3.6	17.0	Granite	4.0	7.6	3.6	21.7	4.4	Alluvial						
893	XX	4045	25	424.4	3.9	420.5	8.8	415.6	4.9	10.1	Granite	3.9	7.3	3.4	27.8	4.9	Alluvial						
894	XX	3223	22	424.2	3.5	420.7	10.0	414.2	6.5	16.0	Granite	3.5	10.0	6.5	21.3	5.0	Alluvial						
895	XX	4044	25	423.9	3.4	420.5	10.5	413.4	7.1	12.0	Granite	3.4	9.7	6.3	21.9	4.4	Alluvial						
896	XX	3224	25	423.7	3.6	420.1	9.6	414.1	6.0	12.6	Granite	3.6	9.6	6.0	18.4	4.2	Alluvial						
897	XX	4043	24	423.8	3.8	420.0	10.2	413.6	6.4	11.6	Granite	3.8	10.2	6.4	33.5	6.9	Alluvial						
898	XX	3225	25	423.7	4.0	419.7	10.2	413.5	6.2	23.0	Granite	4.0	10.2	6.2	26.4	5.9	Alluvial						
899	XX	4042	25	423.6	3.8	419.8	11.0	412.6	7.2	12.0	Granite	3.8	10.0	6.2	25.7	5.6	Alluvial						
900	XX	3226	30	423.3	4.0	419.3	11.8	411.5	7.8	17.5	Granite	4.0	10.5	6.5	15.0	4.2	Alluvial						
901	XX	4041	18	423.0	3.8	419.2	11.1	411.9	7.3	13.5	Granite	3.6	9.4	5.8	25.0	5.1	Alluvial						
902	XX	3227	26	422.7	3.4	419.3	6.5	416.2	3.1	19.5	Granite	3.4	8.0	4.6	16.0	3.7	Alluvial						
903	XX	3228	98	422.4	3.0	419.4	3.0	419.4		16.2	Granite												
904	XX	3229	99	422.5	3.4	419.1	3.4	419.1		15.5	Granite												
905	XX	3230	100	421.6	3.4	418.2	3.4	418.2		17.0	Granite												
906	XX	226	180	422.5	3.4	419.1	3.4	419.1		15.2	Granite												
907	XX	418	398	422.0	7.4	414.6	7.4	414.6		11.5	Granite	1.5	4.5	3.0	9.6	1.4	Alluvial						
908	XX	419	402	421.2	8.4	412.8	8.4	412.8		9.4	Granite												
909	XX	420	397	420.3	9.5	410.8	9.5	410.8		10.0	Granite												
910	XX	421	409	420.0	8.8	411.2	8.8	411.2		9.0	Granite	4.6	8.0	3.5	13.2	1.6	Alluvial						
911	XIX	2135		451.9	9.0	442.9	9.0	442.9		13.0	Granite												
912	XIX	2134	198	448.4	7.0	441.4	7.0	441.4		14.7	Granite												
913	XIX	2112	200	445.4	2.8	442.6	2.8	442.6		21.0	Granite												
914	XIX	2113	198	443.2	3.6	439.6	3.6	439.6		22.3	Granite												
915	XIX	2114	205	442.3	4.2	438.1	4.2	438.1		22.1	Granite												
916	XIX	3119	98	441.1	6.3	434.8	9.5	431.6	3.2	19.0	Granite												
917	XIX	3120	50	440.5	1.5	439.0	8.6	431.9	7.1	22.4	Granite	1.5	3.5	2.0	58.9	16.1	Alluvial	1.5	3.5	2.0	58.9	16.2	Alluvial
918	XIX	2115	46	440.0	5.0	435.0	13.4	426.6	8.4	17.3	Granite	8.7	13.4	4.7	11.0	3.6	Alluvial						
919	XIX	3121	54	439.5	4.0	435.5	4.0	435.5		18.5	Granite	6.0	12.9	6.9	9.3	3.1	Alluvial						
920	XIX	2116	52	438.9	4.0	434.9	14.0	424.9	10.0	18.1	Granite	10.0	12.0	2.0	8.4	2.3	Alluvial						
921	XIX	3122	48	438.5	4.5	434.0	15.2	423.3	10.7	18.2	Granite	4.5	15.2	10.7	9.4	2.5	Alluvial						
922	XIX	2117	50	437.7	5.2	432.5	13.5	424.2	8.3	16.8	Granite	5.2	13.5	8.3	20.3	4.5	Alluvial						
923	XIX	3123	50	437.1	5.0	432.1	15.0	422.1	10.0	22.3	Granite	5.0	15.0	10.0	100.7	3.5	Alluvial	5.2	7.1	1.9	445.5	4.4	Alluvial
924	XIX	2118	50	436.5	4.2	432.3	14.0	422.5	9.8	16.2	Granite	4.2	14.0	9.8	23.0	5.6	Alluvial	11.0	12.9	1.9	54.2	12.5	Alluvial
925	XIX	3124	46	436.3	2.0	434.3	14.4	421.9	12.4	36.0	Granite	2.0	14.4	12.4	26.9	6.3	Alluvial	12.9	14.4	1.5	70.3	18.9	Alluvial
926	XIX	3786	47	435.7	4.7	431.0	15.0	420.7	10.3	35.0	Granite	7.8	15.0	7.2	34.2	7.9	Alluvial						
927	XIX	3125	53	435.2	5.5	429.7	14.7	420.5	9.2	36.7	Granite	7.0	14.7	7.7	17.6	3.7	Alluvial						
928	XIX	2120	48	434.6	5.8	428.8	15.0	419.6	9.2	35.5	Granite	11.0	16.6	5.6	22.0	4.5	Eluvial	12.0	13.2	1.2	54.8	9.6	Alluvial
929	XIX	3126	52	433.8	5.0	428.8	17.1	416.7	12.1	25.0	Granite	12.5	20.0	7.5	25.5	4.9	Eluvial						
930	XIX	2121	44	433.0	5.3	427.7	19.2	413.8	13.9	25.0	Granite	11.0	19.2	8.2	42.0	7.5	Alluvial	11.4	13.0	1.6	64.0	11.8	Alluvial
931	XIX	3127	54	431.9	5.9	426.0	19.5	412.4	13.6	22.0	Granite	10.0	19.5	9.5	38.1	7.2	Alluvial						
932	XIX	2122	50	431.4	5.0	426.4	16.7	414.7	11.7	34.0	Granite	9.0	18.3	9.3	34.2	6.2	Eluvial	10.1	11.6	1.5	53.9	9.2	Alluvial
933	XIX	3128	50	430.6	7.1	423.5	17.9	412.7	10.8	20.6	Granite	9.0	17.9	8.9	35.6	6.5	Alluvial	16.2	18.1	1.9	54.2	8.9	Alluvial
934	XIX	2123	50	429.7	6.9	422.8	17.0	412.7	10.1	34.0	Granite	5.5	20.0	14.5	31.9	6.3	Eluvial	8.9	11.1	2.2	52.8	9.2	Alluvial
935	XIX	3129	48	428.4	7.3	421.1	14.3	414.1	7.0	24.5	Granite	7.3	14.3	7.0	41.3	6.0	Alluvial	9.4	11.2	1.8	62.0	12.2	Alluvial
936	XIX	2124	50	427.6	5.0	422.6	15.0	412.6	10.0	26.6	Granite	5.0	16.0	11.0	35.9	7.5	Eluvial						
937	XIX	3130	48	426.8	2.0	424.8	16.2	410.6	14.2	16.5	Granite	2.0	16.2	14.2	26.1	4.8	Alluvial						
938	XIX	2125	50	426.4	4.0	422.4	15.0	411.4	11.0	21.5	Granite	2.0	15.0	13.0	31.9	5.7	Alluvial	14.0	15.0	1.0	86.7	17.0	Alluvial
939	XIX	3131	48	426.2	5.5	420.7	14.4	411.8	8.9	21.3	Granite	3.5	14.4	10.9	35.3	6.7	Alluvial	9.0	10.8	1.8	78.5	16.6	Alluvial
940	XIX	2126	44	426.0	5.0	421.0	13.5	412.5	8.5	22.5	Granite	5.0	13.5	8.5	24.6	4.9	Alluvial						
941	XIX	3132	52	425.8	4.0	421.8	15.3	410.5	11.3	27.0	Granite	4.0	14.2	10.2	32.9	6.0	Alluvial	8.7	10.6	1.9	63.7	12.2	Alluvial
942	XIX	2127	48	425.6	4.0	421.6	12.1	413.5	8.1	19.3	Granite	6.5	12.1	5.6	35.4	6.6	Alluvial	10.3	12.1	1.8	52.9	8.9	Alluvial
943	XIX	3133	46	425.4	4.4	420.9	14.0	411.3	9.6	23.0	Granite	6.0	14.0	8.0	29.0	6.4	Alluvial						
944	XIX	2128	54	424.8	4.4	420.4	14.3	410.5	9.9	22.8	Granite	5.8	11.8	6.0	29.7	5.3	Alluvial						
945	XIX	4033	26	424.6	4.1	420.5	11.9	412.7	7.8	11.9	Granite	4.1	11.5	7.4	32.5	6.2	Alluvial						
946	XIX	3134	24	424.4	4.7	419.7	11.5	412.9	6.8	23.0	Granite	4.7	11.5	6.8	29.5	5.2	Alluvial						



Appendix 2-9 Mineralogical Analysis of The Karoatkel deposit

No.	LINE No.	DRILL HOLE No.	HOLE DISTANCE (m)	COLLAR ELEVATION (m)	DIAGENETIC BASEMENT				TERTIARY BASEMENT	TOTAL DEPTH OF HOLE (m)	BED ROCK LITHOLOGY	HEAVY MINERAL CONCENTRATION					HEAVY MINERAL CONCENTRATION (OVER 50kg/m <sup>2</sup> ILMENITE)						
					QUARTZ (g)	CLAY (g)	ILLMENITE (g)	ZIRCON (g)				HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )	DEPOSIT TYPE	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )	DEPOSIT TYPE
991	XVIII	3109	56	425.4	5.6	419.8	15.7	409.7	10.1	29.0	Granite	5.6	15.7	10.1	31.8	6.0	Alluvial	12.4	15.2	2.8	52.3	9.2	Alluvial
992	XVIII	1714	48	424.6	4.2	420.4	13.9	410.7	9.7	26.3	Granite	4.2	13.9	9.7	18.3	3.4	Alluvial						
993	XVIII	3110	52	424.3	4.0	420.3	15.2	409.1	11.2	22.0	Granite	4.0	13.0	9.0	35.5	6.7	Alluvial						
994	XVIII	1757	52	424.2	3.0	421.2	15.3	408.9	12.3	15.5	Granite	3.0	15.3	12.3	20.1	3.8	Alluvial						
995	XVIII	3111	50	423.8	4.5	419.3	15.0	408.8	10.5	24.0	Granite	4.5	13.2	8.7	23.3	4.0	Alluvial						
996	XVIII	1713	52	423.6	6.9	416.7	14.9	408.7	8.0	22.2	Granite	7.0	13.0	6.0	23.4	4.7	Alluvial						
997	XVIII	3112	48	423.3	7.0	416.3	14.5	408.8	7.5	20.0	Granite	7.5	14.5	7.0	30.8	6.0	Alluvial						
998	XVIII	3118	48	423.1	3.2	419.9	8.1	415.0	4.9	20.5	Granite	3.2	8.1	4.9	16.4	3.3	Alluvial						
999	XVIII	3113	48	422.9	6.5	416.4	12.0	410.9	5.5	32.0	Granite	6.5	12.0	5.5	28.5	4.3	Alluvial						
1000	XVIII	1712	50	422.7	3.4	419.3	3.4	419.3			Granite												
1001	XVIII	3114	50	422.6	5.0	417.6	5.0	417.6			Granite												
1002	XVIII	3115	48	422.7	5.0	417.7	5.0	417.7			Granite												
1003	XVIII	3116	58	421.0	8.4	412.6	8.4	412.6			Granite												
1004	XVIII	1712A	54	420.8	4.2	416.6	7.2	413.6	3.0	23.1	Granite	4.2	7.0	2.8	13.7	3.1	Alluvial						
1005	XVIII	3117	96	420.3	5.4	414.9	5.4	414.9			Granite												
1006	XVII	4161		438.3	8.9	429.4	8.9	429.4			Granite												
1007	XVII	4160	102	437.3	9.0	428.3	9.0	428.3			Granite												
1008	XVII	3896	97	436.3	7.2	429.1	13.5	422.8	6.3	20.0	Granite	9.0	15.8	6.8	22.2	4.0	Alluvial						
1009	XVII	3903	98	435.1	5.0	430.1	16.1	419.0	11.1	20.1	Granite	16.1	18.1	2.0	35.4	6.1	Alluvial						
1010	XVII	3902	93	433.6	2.8	430.8	16.2	417.4	13.4	23.5	Granite	9.5	16.2	6.7	49.2	8.7	Alluvial	12.1	16.1	4.1	69.6	11.8	Alluvial
1011	XVII	3140	105	432.3	5.0	427.3	11.5	420.8	6.5	21.0	Granite	7.0	11.5	4.5	13.7	3.4	Alluvial						
1012	XVII	3901	58	431.9	4.5	427.4	13.0	418.9	8.5	16.0	Granite	4.5	15.5	11.0	34.1	6.9	Alluvial						
1013	XVII	3141	39	431.8	5.5	426.3	10.3	421.5	4.8	16.5	Granite	9.0	10.3	1.3	57.6	11.0	Alluvial	8.8	10.3	1.5	57.6	11.0	Alluvial
1014	XVII	3142	53	431.5	6.0	425.5	9.8	421.7	3.8	13.5	Granite	8.8	9.8	1.0	47.5	8.4	Alluvial	8.5	9.5	1.0	60.2	11.0	Alluvial
1015	XVII	3143	51	431.0	7.3	423.7	14.3	416.7	7.0	21.1	Granite	8.4	14.3	5.9	28.8	6.5	Alluvial	13.4	14.1	0.7	51.1	11.3	Alluvial
1016	XVII	3144	47	430.7	6.0	424.7	14.2	416.5	8.2	19.4	Granite	7.5	14.2	6.7	32.6	6.9	Alluvial	12.1	14.0	1.9	62.0	13.2	Alluvial
1017	XVII	3145	52	430.3	5.3	425.0	14.8	415.5	9.5	19.5	Granite	7.0	14.8	7.8	30.3	6.0	Alluvial						
1018	XVII	3146	50	429.4	5.4	424.0	17.2	412.2	11.8	21.7	Granite	7.0	17.2	10.2	25.7	5.3	Alluvial						
1019	XVII	3147	50	428.4	3.4	425.0	19.0	409.4	15.6	21.3	Granite	6.0	21.0	15.0	30.0	5.8	Alluvial						
1020	XVII	3148	50	428.3	5.2	423.1	19.0	409.3	13.8	23.5	Granite	5.2	19.0	13.8	31.4	6.7	Alluvial						
1021	XVII	3149	50	427.8	5.4	422.4	19.0	408.8	13.6	26.2	Granite	5.4	13.6	13.6	22.8	4.7	Alluvial						
1022	XVII	3150	50	427.6	6.4	421.2	17.7	409.9	11.3	27.5	Granite	6.4	17.7	11.3	26.3	5.7	Alluvial						
1023	XVII	3151	52	427.0	5.0	422.0	16.0	411.0	11.0	20.6	Granite	5.0	16.0	11.0	33.0	6.8	Alluvial						
1024	XVII	3152	50	428.3	3.7	424.6	14.0	414.3	10.3	18.8	Granite	3.5	14.0	10.5	24.2	5.2	Alluvial						
1025	XVII	3153	50	428.5	5.0	420.8	16.1	409.7	11.1	19.0	Granite	6.0	16.1	10.1	29.1	6.0	Alluvial	10.9	12.9	2.0	51.5	11.1	Alluvial
1026	XVII	3154	52	425.3	4.7	420.6	15.7	409.6	11.0	17.7	Granite	4.7	15.7	11.0	18.6	3.9	Alluvial						
1027	XVII	3155	50	424.6	6.9	417.9	16.7	408.1	9.8	19.0	Granite	11.0	16.7	5.7	16.0	6.1	Alluvial						
1028	XVII	3156	50	424.4	6.0	418.4	16.4	408.0	10.4	19.2	Granite	6.0	16.4	10.4	35.6	7.6	Alluvial	13.7	16.4	2.7	61.4	13.2	Alluvial
1029	XVII	3157	50	423.9	4.6	419.3	17.4	406.5	12.8	17.1	Granite	9.0	15.0	6.0	22.3	4.7	Alluvial						
1030	XVII	3158	50	423.3	6.0	417.3	14.3	409.0	8.3	20.0	Granite	5.6	14.3	8.7	19.5	4.4	Alluvial						
1031	XVII	3159	48	422.3	6.0	416.3	12.1	410.2	6.1	15.3	Granite	6.0	12.1	6.1	32.3	6.4	Alluvial						
1032	XVII	3160	50	421.3	6.1	415.2	10.5	410.8	4.4	12.5	Granite	6.1	8.0	1.9	15.1	3.2	Alluvial						
1033	XVII	3161	50	421.6	4.2	417.4	5.7	415.9	1.5	16.3	Granite	4.2	5.7	1.5	26.2	5.4	Alluvial						
1034	XVII	3162	50	420.8	3.9	416.9	5.3	415.5	1.4	17.8	Granite	3.9	5.3	1.4	29.5	5.5	Alluvial						
1035	XVII	3163	50	421.1	3.9	417.2	3.9	417.2			Granite												
1036	XVII	3164	50	421.1	4.7	416.4	4.7	416.4			Granite												
1037	XVII	3165	50	420.8	6.0	414.8	6.0	414.8			Granite	4.0	5.9	1.9	16.0	1.9	Alluvial						
1038	XVII	3166	50	420.5	5.5	415.0	5.5	415.0			Granite	3.0	5.2	2.2	43.9	7.1	Alluvial						
1039	XVII	3167	50	420.1	4.2	415.9	4.2	415.9			Granite	2.8	4.2	1.4	12.6	1.8	Alluvial						
1040	XVII	3168	48	419.7	5.0	414.7	5.0	414.7			Granite												
1041	XVII	3169	50	419.3	5.4	413.9	5.4	413.9			Granite	10.0	12.0	2.0	62.0	13.6	Eluvial	10.1	12.0	2.0	62.0	13.6	Eluvial
1042	XVII	3170	95	418.8	4.0	414.8	4.0	414.8			Granite												
1043	XVI	1708		431.8	1.8	430.0	1.8	430.0			2.5												
1044	XVI	1707	394	436.6	2.3	434.3	2.3	434.3			4.5												
1045	XVI	1706	398	440.0	1.0	439.0	1.0	439.0			8.0												
1046	XVI	1705	396	442.8	2.6	440.2	2.6	440.2			7.5												
1047	XVI	1704	400	447.9	1.8	446.1	1.8	446.1			7.0												
1048	XVI	1703	200	451.0	2.1	448.9	2.1	448.9			14.0												
1049	XVI	1709	198	454.5	1.8	452.7	1.8	452.7			2.5												
1050	XVI	1702	200	456.1	2.8	453.3	2.8	453.3			3.0												
1051	XVI	1701	198	456.0	3.0	453.0	3.0	453.0			3.0												
1052	XVI	1700	378	454.2	7.5	446.7	7.5	446.7			8.2												
1053	XVI	1699		446.0	6.2	439.8	6.2	439.8			6.5												
1054	XVI	1698	358	441.0	3.0	438.0	3.0	438.0			3.2												
1055	XVI	2136	400	435.7	7.8	427.9	7.8	427.9			10.3												
1056	XVI	2428	198	432.9	8.3	424.6	8.3	424.6			9.4												
1057	XVI	2429	200	431.6	7.6	424.0	7.6	424.0			10.0												
1058	XVI	2137	98	430.8	2.0	428.8	6.2	424.6	4.2	14.7	Granite	5.0	6.2	1.2	35.8	7.4	Alluvial						
1059	XVI	2430	98	430.0	2.8	427.2	11.6	418.4	8.8	15.4	Granite	7.5	11.6	4.1	25.4	4.6	Alluvial						
1060	XVI	2431	100	429.6	3.0	426.6	15.4	414.2	12.4	16.0	Granite	5.0	15.4	10.4	41.8	8.5							























Appendix 2-9 Mineralogical Analysis of The Karatkel deposit

No.	LINE No.	DRILL HOLE No.	HOLE DISTANCE (m)	COLLAR ELEVATION (m)	QUATERNARY BASIN				TERTIARY BASEMENT			TOTAL DEPTH OF HOLE (m)	BED ROCK LITHOLOGY	HEAVY MINERAL CONCENTRATION					HEAVY MINERAL CONCENTRATION (OVER 50kg/m <sup>3</sup> ILMENITE)				
					QUATERNARY DEPTH (m)	QUATERNARY BASE ELEVATION (m)	QUATERNARY DEPTH (m)	QUATERNARY BASE ELEVATION (m)	TERTIARY DEPTH (m)	TERTIARY BASE ELEVATION (m)	TERTIARY DEPTH (m)			TERTIARY BASE ELEVATION (m)	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )	DEPOSIT TYPE	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)
1651	24	2186	89	476.3	1.3	475.0	20.7	455.6	19.4	27.0	Syenite	19.0	27.0	8.0	14.6	1.2	Eluvial						
1652	24	3623	92	475.2	3.1	472.1	23.5	451.7	20.4	24.3	Monzonite	14.8	23.5	8.7	20.9	3.8	Alluvial						
1653	24	2187	98	474.1	4.3	469.8	15.0	459.1	10.7	17.6	Syenite	5.5	17.5	12.0	20.1	2.5	Eluvial						
1654	24	3622	109	474.0	3.0	471.0	11.4	462.6	8.4	21.0	Syenite	11.4	20.1	8.7	13.5	1.1	Eluvial						
1655	24	2188	93	472.3	3.9	468.4	9.0	463.3	5.1	28.5	Syenite	7.7	28.5	20.8	16.7	1.3	Eluvial						
1656	24	3621	97	472.4	5.0	467.4	10.2	462.2	5.2	18.4	Syenite	9.0	18.9	9.0	14.7	1.4	Eluvial						
1657	24	2189	100	473.2	3.0	470.2	18.8	454.4	15.8	24.0	Syenite	18.8	22.0	3.2	19.5	0.4	Eluvial						
1658	24	3620	104	474.0	2.7	471.3	13.6	460.4	10.9	21.4	Monzonite	7.2	20.0	12.8	23.6	2.9	Eluvial						
1659	24	2190	97	474.2	3.0	471.2	4.0	470.2	1.0	16.0	Monzonite	4.0	16.0	12.0	19.3	1.6	Eluvial						
1660	24	3619	92	473.7	2.0	471.7	7.2	466.5	5.2	20.8	Monzonite	7.0	17.8	10.8	23.9	1.8	Eluvial						
1661	24	2191	105	472.3	4.1	468.2	4.1	468.2		7.0	Monzonite	4.1	6.7	2.6	15.8	1.0	Eluvial						
1662	24	3618	97	469.8	3.0	466.8	3.0	466.8		5.5	Monzonite	3.0	5.0	2.0	12.7	0.9	Eluvial						
1663	24	2192	107	467.5	4.7	462.8	6.7	460.8	2.0	24.2	Monzonite	11.5	24.1	12.6	20.3	0.7	Eluvial						
1664	24	3617	89	465.2	5.0	460.2	14.5	450.7	9.5	19.0	Monzonite	8.0	17.0	9.0	38.8	4.6	Eluvial	12.1	14.6	2.5	68.0	11.1	Alluvial
1665	24	2193	102	462.7	5.1	457.6	6.9	455.8	1.8	20.5	Monzonite	6.9	20.5	13.6	17.4	1.6	Eluvial						
1666	24	3616	220	460.7	6.0	454.7	6.0	454.7		16.2	Syenite	6.0	15.4	9.4	17.1	2.6	Eluvial						
1667	24	2194	99	460.8	9.1	451.7	9.1	451.7		19.0	Syenite	9.1	17.0	7.9	18.7	2.1	Eluvial						
1668	24	3615	107	461.7	7.9	453.8	7.9	453.8		13.0	Syenite	7.9	10.0	2.1	7.1	0.4	Eluvial						
1669	24	3614	107	462.8	9.0	453.8	9.0	453.8		14.0	Monzonite	9.0	13.1	4.1	26.8	2.0	Eluvial						
1670	24	3613	95	462.7	9.3	453.4	9.3	453.4		12.8	Monzonite	9.3	12.0	2.7	23.9	1.4	Eluvial						
1671	24	2195	82	463.5	9.0	454.5	9.0	454.5		28.5	Monzonite	9.0	28.5	19.5	22.9	1.8	Eluvial						
1672	24	3617	94	465.0	14.0	451.0	14.0	451.0		20.0	Syenite	14.0	18.0	4.0	15.6	2.6	Eluvial						
1673	24	3612	94	466.9	10.0	456.9	10.0	456.9		26.6	Syenite	10.0	26.0	16.0	20.1	2.2	Eluvial						
1674	24	2196	203	466.7	6.9	459.8	6.9	459.8		16.4	Syenite	6.9	16.2	9.3	25.5	1.8	Eluvial						
1675	24	4131	101	466.0	6.0	460.0	6.0	460.0		8.2	Syenite	6.0	8.0	2.0	0.8	0.6	Eluvial						
1676	24	3611	97	464.8	6.1	458.7	6.1	458.7		15.5	Monzonite	6.1	14.5	8.4	20.7	1.0	Eluvial						
1677	24	3610	100	464.4	8.0	456.4	8.0	456.4		24.6	Monzonite	8.0	23.8	15.8	19.7	1.0	Eluvial						
1678	24	1914	103	462.8	9.0	453.8	9.0	453.8		21.0	Monzonite	9.0	21.0	12.0	29.4	1.1	Eluvial						
1679	24	3609	95	460.8	9.9	450.9	14.6	446.2	4.7	27.9	Monzonite	9.9	27.3	17.4	27.6	2.4	Eluvial	11.8	14.7	2.9	80.5	10.1	Alluvial
1680	24	1833	87	459.0	8.3	450.7	11.5	447.5	3.2	22.0	Syenite	8.3	22.0	13.7	13.0	1.4	Eluvial						
1681	24	3608	93	457.9	8.0	449.9	8.0	449.9		31.0	Syenite	8.0	22.0	14.0	16.5	1.4	Eluvial						
1682	24	1832	103	457.1	7.2	449.9	7.2	449.9		26.0	Syenite	7.2	24.0	16.8	16.7	1.5	Eluvial						
1683	24	3820	195	459.3	10.0	449.3	10.0	449.3		20.0	Monzonite	12.0	20.0	8.0	26.5	2.0	Eluvial	18.3	20.2	2.0	59.9	5.5	Eluvial
1684	24	1831	204	462.0	10.8	451.2	10.8	451.2		20.0	Monzonite	10.8	20.0	9.2	20.2	0.8	Eluvial						
1685	24	3821	200	463.7	7.8	455.9	7.8	455.9		24.1	Monzonite	7.8	24.0	16.2	21.8	0.8	Eluvial						
1686	24	1830	198	463.2	5.0	458.2	5.0	458.2		16.0	Syenite	9.0	13.0	4.0	18.3	0.9	Eluvial						
1687	24	3822	103	462.9	4.1	458.8	7.3	455.6	3.2	11.0	Syenite	7.3	10.0	2.7	23.3	0.8	Eluvial						
1688	24	1829	100	462.8	3.0	459.8	6.6	456.2	3.6	12.0	Monzonite	8.2	12.0	3.8	19.3	0.9	Eluvial						
1689	24	3823	93	463.2	2.9	460.3	2.9	460.3		18.0	Monzonite	3.0	18.0	13.0	20.6	1.0	Eluvial						
1690	24	1828	105	463.7	3.0	460.7	3.0	460.7		18.0	Monzonite	3.0	18.0	15.0	18.3	0.5	Eluvial						
1691	24	3825	95	464.4	1.5	462.9	1.5	462.9		7.6	Syenite	1.5	5.5	4.0	21.1	1.1	Eluvial						
1692	24	1827	95	464.9	3.6	461.3	12.2	452.7	8.6	21.0	Syenite	13.0	21.0	8.0	14.2	1.1	Eluvial						
1693	24	3824	98	465.5	5.2	460.3	5.2	460.3		22.0	Syenite	5.2	22.0	16.8	16.5	0.6	Eluvial						
1694	24	1826	402	464.4	6.2	459.2	6.2	459.2		17.0	Monzonite	6.2	17.0	10.8	23.9	1.3	Eluvial						
1695	24	1825	402	462.7	3.4	449.3	3.4	449.3		5.0	Syenite	0.4	3.4	3.0	24.0	1.3	Alluvial						
1696	30	4114		484.7	5.0	479.7	16.0	468.7	11.0	17.0	Syenite												
1697	30	4113	101	483.0	4.3	478.7	10.6	472.4	6.3	12.2	Syenite												
1698	30	4112	99	481.3	3.2	478.1	15.9	465.4	12.7	18.3	Syenite	13.0	15.9	2.9	21.0	4.2	Alluvial						
1699	30	2197	199	479.8	4.7	475.1	21.8	458.0	17.1	23.5	Syenite	20.6	23.4	2.8	26.2	4.9	Eluvial						
1700	30	3816	101	479.3	4.0	475.3	17.8	461.5	13.8	19.0	Syenite	8.4	10.4	2.0	8.9	1.4	Alluvial						
1701	30	2198	100	479.5	2.0	477.5	21.4	458.1	19.4	29.0	Syenite	20.0	29.0	9.0	15.7	2.8	Eluvial						
1702	30	3815	95	478.2	2.1	476.1	22.0	456.2	19.9	23.7	Syenite	18.0	23.6	5.6	12.6	2.5	Eluvial						
1703	30	2199	107	476.8	5.4	471.4	20.8	456.0	15.4	23.5	Monzonite	11.5	23.5	12.0	12.6	2.8	Eluvial						
1704	30	3814	97	475.8	3.0	472.8	27.6	448.2	24.6	28.8	Syenite	24.0	28.8	4.8	19.3	5.2	Eluvial						
1705	30	2200	99	473.1	6.0	467.1	10.8	462.3	4.8	12.2	Syenite	7.0	11.0	4.0	13.4	2.0	Eluvial						
1706	30	3813	95	471.1	8.0	463.1	18.0	453.1	10.0	22.5	Syenite	14.0	22.4	8.4	11.0	2.4	Eluvial						
1707	30	3607	96	468.4	6.8	461.6	21.1	447.3	14.3	23.7	Syenite	16.3	21.3	5.0	26.2	6.5	Alluvial						
1708	30	3606	102	465.8	5.4	460.4	11.2	454.6	5.8	13.7	Syenite	7.0	9.0	2.0	12.8	2.0	Alluvial						
1709	30	2201	102	463.2	3.7	459.5	11.1	452.1	7.4	13.5	Syenite	7.0	20.0	13.0	15.6	1.7	Eluvial						
1710	30	3605	83	463.0	2.3	460.7	18.3	444.7	16.0	23.0	Syenite	12.0	20.0	8.0	36.2	6.0	Eluvial	15.9	18.3	2.4	73.0	13.5	Alluvial
1711	30	2202	114	462.3	4.0	458.3	17.0	445.3	13.0	17.0	Monzonite	8.0	16.9	8.9	27.4	5.1	Alluvial						
1712	30	3604	108	461.1	4.7	456.4	16.3	444.8	11.6	17.8	Syenite	10.7	16.3	5.6	38.1	4.8	Eluvial	13.4	16.2	2.8	54.0	5.9	Alluvial
1713	30	2203	95	458.9	4.8	454.1	9.8	449.1	5.0	14.1	Monzonite	5.0	14.0	9.0	15.9	1.8	Eluvial						
1714	30	3603	108	457.5	0.5	457.0	2.3	455.2	1.8	6.5	Monzonite	2.3	6.1	3.8	21.9	2.9	Eluvial						
1715	30	2204	92	456.7	3.0	453.7	3.0	453.7		10.0	Monzonite	3.0	10.0										



Appendix 2-9 Mineralogical Analysis of The Karaoitel deposit

No.	LINE No.	DRILL HOLE No.	HOLE DISTANCE (m)	COLLAR ELEVATION (m)	QUATERNARY BASEMENT				TOTAL DEPTH OF HOLE (m)	BED ROCK LITHOLOGY	HEAVY MINERAL CONCENTRATION					HEAVY MINERAL CONCENTRATION (COVER 50kg/m <sup>3</sup> ILMENITE)						
					QUATERNARY DEPTH (m)	ELEVATION IN BASE (m)	TERTIARY DEPTH (m)	TERTIARY BASE ELEVATION (m)			TERTIARY Thickness (m)	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )	DEPOSIT TYPE	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>3</sup> )	ZIRCON (kg/m <sup>3</sup> )
1761	32	1817	202	448.3	3.4	444.9	3.4	444.9	13.5	Syenite	3.4	5.4	2.0	29.1	3.4	Eluvial						
1762	32	1816	202	445.7	2.7	443.0	2.7	443.0	6.5	Syenite	2.8	4.0	1.2	7.6	1.5	Eluvial						
1763	32	4156	208	445.8	3.0	442.8	3.0	442.8	16.2	Syenite	3.0	12.0	9.0	13.3	1.2	Eluvial						
1764	32	1815	194	447.3	3.0	444.3	3.0	444.3	16.0	Monzonite	3.0	16.0	13.0	16.7	3.1	Eluvial						
1765	34	4486		493.3	2.5	490.8	13.3	480.0	10.8	13.3												
1766	34	4485	101	490.5	5.5	485.0	15.0	475.5	9.5	15.3												
1767	34	4484	96	487.2	5.6	481.6	15.6	471.6	10.0	16.0												
1768	34	4483	101	484.9	5.5	479.4	12.3	472.6	6.8	12.7												
1769	34	4482	101	483.2	4.0	479.2	10.0	473.2	6.0	10.3												
1770	34	4111	89	482.2	4.2	478.0	10.0	472.2	5.8	10.5												
1771	34	4110	116	481.2	4.0	477.2	9.5	471.7	5.5	9.7												
1772	34	4109	107	480.3	3.0	477.3	8.1	472.2	5.1	10.0												
1773	34	2028	301	478.1	2.9	475.2	7.9	470.2	5.0	9.0												
1774	34	3574	97	477.1	2.1	475.0	18.4	458.7	16.3	22.5	10.7	21.0	10.3	22.6	4.3	Eluvial/Alluvial	14.6	15.6	1.0	50.2	8.2	Alluvial
1775	34	2027	103	475.9	4.0	471.9	7.2	468.7	3.2	12.8	10.0	12.6	2.6	12.7	1.2	Alluvial						
1776	34	3573	102	474.9	1.8	473.1	3.1	471.8	1.3	7.5	3.0	6.5	3.5	12.9	2.4	Alluvial						
1777	34	2026	96	470.9	1.0	469.9	4.0	466.9	3.0	18.3	6.0	8.0	2.0	13.9	1.6	Eluvial						
1778	34	3572	113	467.8	1.1	466.7	1.1	466.7		10.5	1.1	9.7	8.6	18.1	1.8	Eluvial						
1779	34	2025	92	467.1	1.0	466.1	1.0	466.1		10.4	1.0	3.0	2.0	12.8	1.8	Eluvial						
1780	34	3571	97	465.7	2.8	462.9	2.8	462.9	13.5	Monzonite	2.8	12.0	9.2	20.6	2.4	Eluvial						
1781	34	3570	94	462.7	1.5	461.2	1.5	461.2	25.3	Syenite	1.5	18.0	16.5	17.0	1.5	Eluvial						
1782	34	3569	98	460.0	1.9	458.1	1.9	458.1	24.0	Monzonite	1.9	15.0	13.1	21.0	0.8	Eluvial						
1783	34	2024	106	457.2	2.0	455.2	8.0	449.2	6.0	21.2	16.0	21.0	5.0	27.5	1.5	Eluvial						
1784	34	3568	100	454.3	3.2	451.4	10.2	444.4	7.0	14.0	10.2	13.5	3.3	13.7	1.0	Eluvial						
1785	34	2023	99	452.8	1.6	451.2	5.9	446.9	4.3	16.9	11.0	15.0	4.0	15.6	0.8	Eluvial						
1786	34	3567	105	451.9	1.3	450.6	12.6	439.3	11.3	16.1	9.3	12.5	3.2	30.9	5.4	Alluvial	10.1	11.1	1.0	54.7	10.0	Alluvial
1787	34	2022	94	451.2	1.4	449.8	12.0	439.2	10.6	12.3	6.0	12.0	6.0	36.7	6.7	Alluvial						
1788	34	3566	98	450.1	1.0	449.1	13.9	436.2	12.9	28.7	9.2	24.0	14.8	26.3	3.4	Eluvial/Alluvial	11.1	13.8	2.7	64.7	11.8	Alluvial
1789	34	2021	93	449.0	1.7	447.3	14.0	435.0	12.3	20.3	7.8	19.0	10.2	28.6	4.1	Eluvial/Alluvial						
1790	34	3565	104	448.2	1.0	447.2	14.1	434.1	13.1	24.0	7.0	24.0	17.0	29.4	2.9	Eluvial/Alluvial	11.0	14.0	3.0	59.0	9.3	Alluvial
1791	34	2020	101	447.7	2.0	445.7	9.0	438.7	7.0	21.0	3.0	9.2	6.2	24.7	6.5	Alluvial						
1792	34	3564	94	447.4	1.7	445.7	1.7	445.7		5.5	2.0	4.5	2.5	18.2	0.8	Eluvial						
1793	34	2019	101	446.9	2.0	444.9	2.0	444.9	13.6	Monzonite	5.0	9.0	4.0	15.4	0.4	Eluvial						
1794	34	3802	140	446.4	3.8	442.6	7.4	439.0	3.6	18.5	3.8	14.4	10.6	41.7	5.4	Eluvial/Alluvial	3.8	7.3	3.5	87.1	13.2	Alluvial
1795	34	2018	96	446.4	5.0	441.4	5.4	441.0	0.4	21.0	5.0	21.0	16.0	19.5	1.3	Eluvial/Alluvial						
1796	34	3563	95	446.4	4.1	442.3	5.1	441.3	1.0	21.5	4.1	24.6	20.5	22.3	1.4	Eluvial/Alluvial	4.1	5.1	1.0	76.8	12.3	Alluvial
1797	34	3562	96	446.4	3.4	443.0	3.4	443.0		22.5	3.4	21.6	18.2	23.8	2.2	Eluvial	8.1	10.0	1.9	52.1	3.9	Eluvial
1798	34	3561	95	446.7	3.4	443.3	3.4	443.3		16.8	3.4	15.0	11.6	12.0	1.5	Eluvial						
1799	34	2017	94	446.9	2.7	444.2	2.7	444.2		7.4	2.7	7.4	4.7	27.3	1.7	Eluvial						
1800	34	3560	95	447.7	3.3	444.4	3.3	444.4		14.0	3.3	13.0	9.7	17.6	1.1	Eluvial						
1801	34	3559	94	449.3	3.5	445.8	3.5	445.8		20.0	3.5	19.0	15.5	16.5	1.7	Eluvial						
1802	34	3558	94	451.3	3.1	448.2	3.1	448.2		13.5	3.1	12.0	8.9	16.8	2.7	Eluvial						
1803	34	1912	96	452.9	2.5	450.4	2.5	450.4		11.1	2.5	11.0	8.5	24.9	2.2	Eluvial						
1804	34	3801	93	453.7	4.0	449.7	4.0	449.7		9.0	4.0	9.0	5.0	28.5	0.6	Eluvial						
1805	34	3557	92	453.8	4.0	449.8	4.0	449.8		16.0	4.0	12.0	8.0	18.1	0.9	Eluvial	10.1	12.1	2.0	77.4	0.8	Eluvial
1806	34	3556	96	453.5	2.2	451.3	2.2	451.3		4.5	2.0	3.7	1.7	19.4	0.6	Eluvial						
1807	36	3974		452.0	2.0	450.0	2.0	450.0		7.0	2.0	6.5	4.5	20.3	1.3	Eluvial						
1808	36	3973	108	449.2	3.0	446.2	3.0	446.2		7.0	3.0	5.5	2.5	9.6	1.9	Eluvial						
1809	36	1814	92	446.7	4.5	442.2	6.6	440.1	2.1	18.0	4.5	18.0	13.5	25.5	1.8	Eluvial/Alluvial	6.1	6.6	0.5	108.2	14.3	Alluvial
1810	36	3972	98	444.7	6.0	438.7	7.5	437.2	1.5	22.0	6.0	22.0	16.0	31.2	2.5	Eluvial/Alluvial	6.0	7.3	1.3	55.0	4.8	Alluvial
1811	36	1813	98	444.2	3.5	438.8	5.2	437.1	1.7	7.0	3.5	7.0	3.5	57.6	7.9	Eluvial/Alluvial	4.1	5.8	1.7	88.5	15.0	Alluvial
1812	36	3971	100	440.4	4.0	436.4	4.0	436.4		19.0	4.0	19.0	15.0	22.4	1.7	Eluvial/Alluvial						
1813	36	3970	108	438.8	3.9	434.9	3.9	434.9		9.0	4.0	8.0	4.0	19.7	1.6	Eluvial						
1814	36	3969	92	438.6	4.0	434.6	4.0	434.6		14.5	4.0	10.9	6.9	10.9	2.0	Eluvial						
1815	36	1812	102	438.8	4.7	434.1	4.7	434.1		7.5	4.7	7.5	2.8	12.8	1.5	Eluvial						
1816	36	3968	98	439.2	6.0	433.2	6.0	433.2		14.0	6.0	14.0	8.0	16.1	2.5	Eluvial						
1817	36	1811	102	438.9	3.0	435.9	3.4	435.5	0.4	8.0	3.0	5.0	2.0	41.9	4.0	Eluvial/Alluvial	3.4	4.0	0.6	110.7	16.1	Alluvial
1818	36	3967	98	439.2	2.8	436.4	2.8	436.4		9.5	2.8	9.0	6.2	17.9	2.0	Eluvial						
1819	36	1810	104	440.1	2.9	437.2	4.8	435.3	1.9	11.0	2.9	11.0	8.1	44.0	7.3	Eluvial/Alluvial	2.8	5.2	2.4	114.0	21.2	Alluvial
1820	36	3966	96	441.1	1.3	439.8	1.3	439.8		10.5	1.3	10.0	8.7	22.9	2.6	Eluvial						
1821	36	1809	100	442.0	2.6	439.4	4.0	438.0	1.4	13.0	2.6	13.0	10.4	27.6	2.9	Eluvial/Alluvial	2.9	3.5	0.6	75.0	12.7	Alluvial
1822	36	3965	110	443.6	2.6	441.0	2.6	441.0		19.5	2.6	19.0	16.4	17.0	2.3	Eluvial/Alluvial						
1823	36	1808	96	444.4	1.8	442.6	1.8	442.6		8.5	1.9	8.5	6.6	22.0	2.8	Eluvial						
1824	36	3964	92	443.7	2.2	441.5	2.2	441.5		15.0	2.2	14.6	12.4	18.9	2.1	Eluvial						
1825	36	3963	108	444.5	5.0	439.5	5.0	439.5		25.0	5.0	25.0	20.0	18.7	2.2	Eluvial						
1826	36	3962	102	446.4	3.0	443.4	3.0	443.4		26.0	3.0	23.0	20.0	16.7	2.5	Eluvial						
1827	36	1807	95	449.6	2.5	447.1	2.5	447.1		7.0	6.0	17.0	11.0	14.9	1.2	Eluvial						
1828	36	3961	100	453.2	4.5	448.7	4.5	448.7		9.0	4.0	7.5	3.5	20.8	2.5	Eluvial						







Appendix 2-9 Mineralogical Analysis of The Karatkel deposit

No.	LINE NO.	DRILL HOLE NO.	HOLE DISTANCE (m)	COLLAR ELEVATION (m)	QUATERNARY BASEMENT				TOTAL DEPTH OF HOLE (m)	RED ROCK LITHOLOGY	HEAVY MINERAL CONCENTRATION					HEAVY MINERAL CONCENTRATION (OVER 50% <sup>2</sup> /m <sup>2</sup> ILMENITE)						
					QUATERNARY DEPTH (m)	QUATERNARY BY BASE ELEVATION (m)	QUATERNARY DEPTH (m)	QUATERNARY BY BASE ELEVATION (m)			QUATERNARY DEPTH (m)	QUATERNARY BY BASE ELEVATION (m)	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>2</sup> )	ZIRCON (kg/m <sup>2</sup> )	DEPOSIT TYPE	HANGING-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE (kg/m <sup>2</sup> )
1981	42	1378	24	450.5	4.0	446.5	4.0	446.5	11.0	Monzonite	4.0	11.0	7.0	25.1	1.2	Eluvial						
1982	42	1377	28	450.3	3.0	447.3	3.0	447.3	7.0	Monzonite	3.0	7.0	4.0	24.1	0.7	Eluvial						
1983	42	1376	24	450.0	3.0	447.0	3.0	447.0	8.0	Monzonite	3.0	8.0	5.0	27.3	1.6	Eluvial						
1984	42	1375	25	449.8	3.0	446.8	3.0	446.8	11.5	Monzonite	3.0	11.3	8.3	25.1	1.2	Eluvial						
1985	42	1374	24	449.7	3.4	446.3	3.4	446.3	19.3	Monzonite	3.4	17.0	13.6	18.9	1.0	Eluvial						
1986	42	1373	27	449.4	3.0	446.4	3.0	446.4	10.0	Monzonite	4.0	10.0	6.0	26.4	1.0	Eluvial						
1987	42	1372	25	449.3	2.0	447.3	2.0	447.3	12.9	Monzonite	3.0	12.9	9.9	46.5	1.6	Eluvial	6.0	7.0	1.0	163.7	5.0	Eluvial
1988	42	1371	24	449.1	3.5	445.6	3.5	445.6	12.2	Monzonite	3.5	12.2	8.7	24.9	1.0	Eluvial						
1989	42	1370	25	448.9	3.2	445.7	3.2	445.7	13.2	Monzonite	3.2	13.2	10.0	27.8	0.8	Eluvial						
1990	42	1369	28	448.7	4.0	444.7	4.0	444.7	12.0	Monzonite	4.0	12.0	8.0	32.6	1.3	Eluvial	5.0	6.0	1.0	52.1	2.5	Eluvial
1991	42	1368	25	448.5	3.6	444.9	3.6	444.9	13.8	Monzonite	3.6	13.8	10.2	29.9	1.1	Eluvial						
1992	42	1367	25	448.2	3.0	445.2	3.0	445.2	10.0	Monzonite	3.0	9.0	6.0	30.3	0.8	Eluvial						
1993	42	1366	26	448.0	3.0	445.0	3.0	445.0	9.4	Monzonite	3.0	9.4	6.4	23.6	1.0	Eluvial						
1994	42	1365	24	447.8	4.0	443.8	4.0	443.8	11.5	Monzonite	4.0	11.5	7.5	28.1	0.8	Eluvial						
1995	42	1364	24	447.7	4.0	443.7	4.0	443.7	9.5	Monzonite	4.0	9.5	5.5	22.5	0.9	Eluvial						
1996	42	1363	24	447.6	4.0	443.6	4.0	443.6	10.5	Monzonite	4.0	10.5	6.5	32.9	1.7	Eluvial/Alluvial	4.0	5.0	1.0	63.4	4.9	Alluvial
1997	42	1362	28	447.4	5.0	442.4	5.0	442.4	2.0	Monzonite	5.0	12.0	7.0	42.4	3.2	Eluvial/Alluvial	6.0	7.0	1.0	120.2	12.9	Alluvial
1998	42	1361	26	447.3	5.4	441.9	5.4	441.9	0.6	Monzonite	5.4	13.4	8.0	25.0	0.8	Eluvial/Alluvial						
1999	42	1360	30	447.3	5.2	442.1	5.2	442.1	1.8	Monzonite	5.2	14.0	8.8	30.3	1.0	Eluvial/Alluvial						
2000	42	1359	24	447.2	6.4	441.2	6.4	441.2	1.0	Syenite	6.0	16.0	10.0	26.4	0.8	Eluvial/Alluvial						
2001	42	1358	25	447.2	6.3	440.9	6.3	440.9	2.7	Syenite	6.3	12.7	5.7	19.8	1.8	Eluvial/Alluvial						
2002	42	1357	24	447.3	7.0	440.3	7.0	440.3	8.8	Monzonite	7.0	14.7	7.7	23.8	1.1	Eluvial/Alluvial						
2003	42	1356	26	447.4	7.0	440.4	7.0	440.4	13.8	Monzonite	7.0	15.0	8.0	26.2	4.0	Eluvial/Alluvial						
2004	42	1355	26	447.8	7.0	440.8	7.0	440.8	8.8	Monzonite	7.1	16.8	9.7	27.6	3.7	Eluvial/Alluvial	14.2	15.2	1.0	96.0	16.2	Alluvial
2005	42	1354	26	447.9	5.0	442.9	5.0	442.9	10.5	Monzonite	5.0	16.5	11.5	24.6	3.9	Eluvial/Alluvial	13.7	15.7	2.0	60.9	10.8	Alluvial
2006	42	1353	23	448.0	7.0	441.0	7.0	441.0	9.5	Monzonite	8.0	16.0	8.0	32.5	5.1	Alluvial	13.8	16.5	2.7	68.6	10.1	Alluvial
2007	42	1352	22	448.2	6.2	442.0	6.2	442.0	8.8	Monzonite	8.0	15.0	7.0	35.9	6.0	Alluvial	10.8	12.5	1.7	60.2	10.2	Alluvial
2008	42	1351	24	448.3	6.0	442.3	6.0	442.3	5.8	Monzonite	6.0	14.0	8.0	26.7	4.2	Eluvial/Alluvial	13.0	14.2	1.2	57.2	9.8	Eluvial
2009	42	1350	26	448.3	5.5	442.8	5.5	442.8	10.3	Monzonite	9.8	15.8	6.0	32.0	4.9	Alluvial						
2010	42	1349	24	448.5	5.8	442.7	5.8	442.7	10.7	Monzonite	9.0	21.0	12.0	37.5	5.1	Eluvial/Alluvial	13.8	18.7	4.9	63.0	9.3	Eluvial/Alluvial
2011	42	1348	26	448.7	7.0	441.7	7.0	441.7	10.5	Monzonite	8.0	18.5	10.5	57.3	9.4	Eluvial/Alluvial	10.8	18.5	7.7	68.4	10.7	Eluvial/Alluvial
2012	42	1347	21	448.9	7.0	441.9	7.0	441.9	15.0	Monzonite	10.0	15.0	5.0	50.9	7.8	Eluvial/Alluvial	11.3	15.0	3.7	62.7	9.7	Eluvial/Alluvial
2013	42	1346	22	449.1	6.8	442.3	6.8	442.3	7.5	Monzonite	9.0	14.5	5.5	43.1	7.1	Alluvial	10.5	14.5	4.0	62.3	10.2	Alluvial
2014	42	1345	22	449.2	7.2	442.0	7.2	442.0	6.8	Monzonite	11.0	15.0	4.0	52.2	8.7	Eluvial/Alluvial	12.7	15.0	2.3	66.4	11.7	Eluvial/Alluvial
2015	42	1344	30	449.4	8.2	441.2	8.2	441.2	5.8	Monzonite	8.2	14.0	5.8	38.2	5.7	Alluvial	12.3	14.0	1.7	60.1	9.6	Alluvial
2016	42	1343	30	449.6	8.0	441.6	8.0	441.6	7.5	Monzonite	8.0	15.0	7.0	38.3	6.2	Alluvial	10.0	13.0	3.0	53.1	8.4	Alluvial
2017	42	1342	26	449.7	8.0	441.7	8.0	441.7	6.6	Monzonite	8.0	15.1	7.1	37.4	5.7	Eluvial/Alluvial	12.4	15.1	2.7	54.1	8.9	Eluvial/Alluvial
2018	42	1341	27	449.8	9.7	440.1	9.7	440.1	3.5	Monzonite	9.7	17.0	7.3	32.6	3.3	Eluvial/Alluvial	10.8	11.9	1.1	60.5	9.3	Alluvial
2019	42	1340	24	449.9	9.9	440.0	9.9	440.0	3.1	Monzonite	9.9	16.0	6.1	38.9	5.3	Eluvial/Alluvial	11.8	12.9	1.1	58.4	11.3	Alluvial
2020	42	1339	27	449.9	9.2	440.7	9.2	440.7	5.3	Monzonite	11.0	18.0	7.0	30.0	4.7	Eluvial/Alluvial	11.6	14.0	2.4	61.8	10.8	Alluvial
2021	42	1338	23	449.9	9.8	440.1	9.8	440.1	4.1	Monzonite	9.8	15.0	5.2	38.8	6.2	Eluvial/Alluvial	11.0	14.0	3.0	56.1	10.0	Eluvial/Alluvial
2022	42	1337	27	450.1	11.0	439.1	11.0	439.1	1.0	Monzonite	11.0	15.0	4.0	51.7	7.4	Eluvial/Alluvial	10.4	12.3	1.9	89.3	14.0	Alluvial
2023	42	1336	34	450.2	6.0	444.2	6.0	444.2	11.5	Monzonite	6.0	11.5	5.5	26.4	1.5	Eluvial						
2024	42	1604	38	450.4	9.8	440.6	9.8	440.6	3.2	Monzonite	9.8	13.0	3.2	108.8	15.5	Alluvial	9.8	13.0	2.5	115.1	16.2	Alluvial
2025	42	1603	44	450.4	8.5	441.9	8.5	441.9	3.9	Monzonite	8.5	13.0	4.5	50.1	4.1	Eluvial	9.8	11.7	2.0	65.6	5.9	Alluvial
2026	42	1608	44	450.8	7.5	443.3	7.5	443.3	10.0	Monzonite	7.5	10.0	2.5	16.3	11.0	Eluvial						
2027	42	1910	368	456.0	6.5	449.5	6.5	449.5	25.0	Monzonite	6.0	25.0	19.0	26.7	4.0	Eluvial						
2028	44	1400		476.8	1	475.8	7.6	469.2	6.6	7.6												
2029	44	1399	104	475.9	1	474.9	6.9	469.0	5.9	8												
2030	44	1398	100	472.0	1	471.0	20	452.0	19.0	20.5												
2031	44	1397	98	466.8	1.8	465.0	16	450.8	14.2	19												
2032	44	287	100	463.5	4	459.5	17	446.5	13.0	17												
2033	44	1396	100	461.8	3.4	458.4	15.5	446.3	12.1	16												
2034	44	1318	97	460.3	3.1	457.2	14	446.3	10.9	17.5												
2035	44	562	192	457.7	2.4	455.3	2.4	455.3	5.2	Monzonite	2.4	5.2	2.8	22.1	2.1	Eluvial						
2036	44	1317	183	455.9	2	453.9	2	453.9	20	Monzonite	2.0	20.0	18.0	30.0	0.3	Eluvial						
2037	44	1395	100	455.0	2	453.0	2	453.0	10.5	Monzonite	2.0	10.5	8.5	25.5	1.5	Eluvial						
2038	44	286	86	454.3	2	452.3	10.1	444.2	8.1	11.3												
2039	44	1394	145	453.1	3.6	449.5	3.6	449.5	5.2	Monzonite	3.6	5.2	1.6	32.4	1.9	Eluvial						
2040	44	1316	50	452.5	3.5	449.0	3.5	449.0	13.5	Monzonite	3.5	13.5	10.0	24.2	0.3	Eluvial						
2041	44	284	246	450.3	4	446.3	4	446.3	8.6	Monzonite	4.0	8.6	4.6	0.5	0.1	Eluvial						
2042	44	1393	44	449.7	3	446.7	3	446.7	9.5	Monzonite	3.0	9.5	6.5	24.9	1.5	Eluvial						
2043	44	1392	56	449.2	3	446.2	3	446.2	8	Monzonite	3.0	8.0	5.0	2.2	0.7	Eluvial						
2044	44	1391	48	448.7	3	445.7	4.2	444.5	1.2	14.9												
2045	44	285	52	448.1	2.5	445.6	3.3	444.8	0.8	16.2												
2046	44	1390	50	447.5	3	444.5	3	444.5	12	Monzonite	3.0	12.0	9.0									











Appendix 2-9 Mineralogical Analysis of The Karatkel deposit

No.	LINE No.	DRILL HOLE No.	HOLE DISTANCE (m)	COLLAR ELEVATION (m)	QUARTZITE BASEMENT				TOTAL DEPTH OF HOLE (m)	BED ROCK LITHOLOGY	HEAVY MINERAL CONCENTRATION					HEAVY MINERAL CONCENTRATION (OVER 50kg/m <sup>2</sup> ILMENITE)							
					QUARTZITE QUARTZITE QUARTZITE QUARTZITE	QUARTZITE QUARTZITE QUARTZITE QUARTZITE	QUARTZITE QUARTZITE QUARTZITE QUARTZITE	QUARTZITE QUARTZITE QUARTZITE QUARTZITE			Ore Thickness (m)	ILMENITE (kg/m <sup>2</sup> )	ZIRCON (kg/m <sup>2</sup> )	DEPOSIT TYPE	HANGING G-WALL DEPTH (m)	FOOT WALL DEPTH (m)	Ore Thickness (m)	ILMENITE E (kg/m <sup>2</sup> )	ZIRCON (kg/m <sup>2</sup> )	DEPOSIT TYPE			
2311	54	2055	96	470.0	5.3	464.7	24.2	445.8	18.9	26.5	Syenite	17.7	24.5	6.8	18.5	3.0	Alluvial						
2312	54	3829	102	469.0	4.1	464.9	26.0	443.0	21.9	26.5	Syenite	23.8	25.7	1.9	21.5	3.9	Alluvial						
2313	54	2054	97	467.8	5.8	462.0	22.8	445.0	17.0	25.0	Monzonite	20.0	25.0	5.0	14.9	2.7	Eluvial/Alluvial						
2314	54	3830	86	466.3	2.6	463.7	22.5	443.8	19.9	24.0	Monzonite	18.0	22.5	4.5	10.1	2.1	Alluvial						
2315	54	2053	89	465.0	4.0	461.0	20.9	444.1	16.9	22.8	Syenite	18.0	21.0	3.0	19.5	3.6	Alluvial						
2316	54	3831	122	463.8	2.9	460.9	11.1	452.7	8.2	14.0	Syenite	11.0	13.0	2.0	11.5	1.4	Eluvial						
2317	54	2052	96	463.2	1.8	461.4	12.0	451.2	10.2	17.0	Syenite	15.0	16.9	1.9	12.3	1.7	Eluvial						
2318	54	3832	104	462.5	3.0	459.5	11.9	450.8	8.9	17.0	Syenite	14.0	16.0	2.0	10.3	1.5	Eluvial						
2319	54	2051	97	462.0	8.9	453.1	21.0	441.0	12.1	22.0	Syenite	14.0	21.0	7.0	21.3	3.9	Alluvial						
2320	54	3833	100	462.3	4.3	458.0	16.8	445.5	12.5	20.0	Syenite	14.7	20.0	5.3	12.7	1.9	Eluvial/Alluvial						
2321	54	2050	98	462.5	5.9	456.6	17.8	444.7	11.9	25.5	Syenite	14.0	25.4	11.4	12.5	1.7	Eluvial/Alluvial						
2322	54	3834	100	461.9	4.9	457.0	19.5	442.4	14.6	29.0	Syenite	17.8	21.0	3.2	11.6	2.1	Eluvial/Alluvial						
2323	54	2049	100	461.2	7.0	454.2	9.6	451.6	2.6	20.9	Syenite	11.7	20.9	9.2	16.8	1.8	Eluvial						
2324	54	3835	104	459.8	4.0	455.8	8.7	451.1	4.7	25.0	Syenite	8.7	17.5	8.8	12.1	1.8	Eluvial/Alluvial						
2325	54	2048	98	459.2	4.9	454.3	11.9	447.3	7.0	22.2	Syenite	14.0	22.0	8.0	17.3	1.8	Eluvial						
2326	54	3836	102	459.1	5.8	453.3	8.3	450.8	2.5	20.5	Syenite	12.5	18.5	6.0	12.1	1.5	Eluvial						
2327	54	2047	90	458.4	5.5	452.9	7.8	450.6	2.3	13.0	Syenite	7.8	13.0	5.2	11.5	2.0	Eluvial/Alluvial						
2328	54	3837	102	456.9	5.4	451.5	5.4	451.5	9.0		Syenite	5.4	7.2	1.8	10.0	1.6	Eluvial						
2329	54	2046	98	455.2	4.0	451.2	4.0	451.2	6.1		Syenite	4.0	6.0	2.0	15.0	1.4	Eluvial						
2330	54	3838	98	453.6	2.2	451.4	2.2	451.4	15.9		Syenite	3.1	8.5	5.4	17.2	2.3	Eluvial						
2331	54	2045	100	449.8	3.8	446.0	3.8	446.0	11.0		Syenite	3.8	11.0	7.2	16.2	3.1	Eluvial						
2332	54	3839	108	446.0	3.0	443.0	3.0	443.0	15.0		Syenite	3.0	10.8	7.8	13.1	2.2	Eluvial						
2333	54	2044	92	444.0	0.5	443.5	2.8	441.2	2.3	17.0	Gabbro	0.5	6.0	5.5	11.4	1.6	Eluvial/Alluvial						
2334	54	2043	195	442.2	5.0	437.2	13.7	428.5	8.7	18.0	Monzonite	5.0	13.2	8.2	46.2	7.4	Alluvial	6.0	10.0	4.0	55.8	8.7	Alluvial
2335	54	2042	199	441.7	1.0	440.7	12.0	429.7	11.0	22.5	Monzonite	6.3	20.0	13.7	18.3	1.4	Eluvial/Alluvial						
2336	54	2041	200	440.8	2.0	438.8	4.3	436.5	2.3	18.2	Gabbro	2.0	17.8	15.8	24.7	1.7	Eluvial	4.2	5.7	1.5	51.2	8.2	Eluvial
2337	54	2040	192	438.8	3.8	435.0	5.6	433.2	1.8	16.2	Gabbro	3.8	16.0	12.2	17.5	1.7	Eluvial/Alluvial						
2338	54	2039	200	435.4	3.5	431.9	17.0	418.4	13.5	21.0	Gabbro	7.0	20.4	13.4	39.4	8.0	Eluvial/Alluvial	12.0	17.0	5.0	60.1	8.2	Alluvial
2339	54	2038	200	432.8	1.1	431.7	7.9	424.9	6.8	12.0	Syenite	1.1	12.0	13.4	39.4	8.0	Eluvial/Alluvial						
2340	54	2037	190	432.9	2.2	430.7	2.2	430.7	16.7		Gabbro	2.2	16.5	14.3	18.8	0.6	Eluvial/Alluvial						
2341	54	1907	204	437.2	5.2	432.0	9.0	428.2	3.8	14.5	Gabbro	7.0	14.4	7.4	17.5	0.6	Eluvial/Alluvial						
2342	54	1181	220	437.9	5.6	432.3	5.6	432.3	7.0		Gabbro	5.6	7.0	1.4	23.5	6.6	Eluvial						
2343	54	1126	510	439.3	4.0	435.3	4.0	435.3	8.4		Syenite	4.0	8.4	4.4	20.4	3.7	Eluvial						
2344	54	1125	98.5	439.8	5.6	434.2	5.6	434.2	20.2		Syenite	5.6	20.2	14.6	14.3	3.1	Eluvial						
2345	54	1124	100	441.1	9.6	431.5	9.6	431.5	21.5		Syenite	9.6	21.5	11.9	23.3	2.0	Eluvial						
2346	54	1123	100	441.9	9.0	432.9	9.0	432.9	21.0		Granite												
2347	54	3329	48	442.1	10.6	431.5	10.6	431.5	25.5		Granite												
2348	54	1122	50	442.0	10.0	432.0	14.0	428.0	4.0	21.0	Granite	12.0	13.0	1.0	10.5	2.9	Alluvial						
2349	54	1121	98	441.9	12.0	429.8	18.0	423.9	6.0	22.5	Granite	12.0	18.0	6.0	48.7	8.1	Alluvial	15.8	18.0	2.2	95.6	17.7	Alluvial
2350	54	2393	46	441.6	9.0	432.6	18.9	422.7	9.9	27.0	Granite	9.0	18.9	9.9	43.8	7.1	Alluvial	14.0	18.9	4.9	69.7	11.7	Alluvial
2351	54	1120	54	441.3	10.0	431.3	16.2	425.1	6.2	19.9	Granite	10.0	16.2	6.2	79.0	15.1	Alluvial	10.0	16.2	6.2	79.0	15.1	Alluvial
2352	54	217	102	441.2	5.3	435.9	15.1	426.1	9.8	14.2	Granite	11.0	13.2	2.2	55.7	8.7	Alluvial	11.0	12.2	1.2	75.8	9.6	Alluvial
2353	54	3286	54	441.5	3.0	438.5	15.0	426.5	12.0	24.0	Granite	10.0	14.4	4.4	58.2	1.6	Alluvial	12.3	14.4	2.1	111.9	20.4	Alluvial
2354	54	1119	42	442.1	7.5	434.6	15.3	426.8	7.8	19.0	Granite	11.0	15.3	4.3	44.2	10.5	Alluvial	11.6	12.8	1.2	55.0	13.8	Alluvial
2355	54	1118	98	442.9	9.0	433.9	16.0	426.9	7.0	24.0	Granite	11.0	18.0	7.0	36.2	10.7	Eluvial/Alluvial	13.0	15.8	2.8	51.7	12.2	
2356	54	1870	70	443.2	5.0	438.2	12.0	431.2	7.0	18.0	Granite	5.0	12.0	7.0	16.5	2.4	Alluvial						
2357	54	1117	28	443.2	7.7	435.5	16.5	426.7	8.8	30.0	Granite	13.0	16.5	3.5	28.6	6.7	Alluvial	15.5	16.5	1.0	56.4	13.4	Alluvial
2358	54	1116	102	443.1	8.8	434.3	16.2	426.9	7.4	24.0	Granite	8.8	16.2	7.4	23.3	6.2	Alluvial						
2359	54	3234	47	443.2	11.0	432.2	17.0	426.2	6.0	27.0	Granite	11.0	17.0	6.0	25.7	6.5	Alluvial	15.0	17.0	2.0	61.2	1.2	Alluvial
2360	54	1115	55	442.7	7.0	435.7	16.4	426.3	9.4	19.0	Granite	10.0	16.4	6.4	16.7	4.7	Alluvial						
2361	54	1114	100	442.6	5.4	437.2	12.0	430.6	6.6	12.9	Granite	10.5	12.0	1.5	24.4	10.3	Alluvial						
2362	54	3171	72	442.8	7.7	435.1	8.5	434.3	0.8	19.5	Granite												
2363	54	1113	126	442.9	10.0	432.9	10.0	432.9	17.3		Granite	9.0	10.0	1.0	6.3	4.0	Alluvial						
2364	56	1581	46	454.9	1.4	453.5	8.0	446.9	6.6	13.0	Syenite	8.0	13.0	5.0	15.9	1.8	Eluvial						
2365	56	1580	196	454.0	1.9	452.1	4.2	449.8	2.3	8.0	Syenite	1.9	8.0	6.1	17.4	3.3	Eluvial/Alluvial						
2366	56	1579	202	454.2	3.4	450.8	10.3	443.9	6.9	12.2	Syenite	8.0	12.2	4.2	23.5	4.6	Eluvial/Alluvial						
2367	56	1578	193	452.9	3.0	449.8	8.0	444.9	5.0	18.5	Syenite	4.0	18.5	14.5	20.7	4.6	Eluvial/Alluvial						
2368	56	1577	215	448.7	2.0	446.7	4.7	444.0	2.7	15.0	Syenite	2.5	15.0	12.5	19.6	3.0	Eluvial/Alluvial						
2369	56	1576	205	442.4	1.2	441.2	1.2	441.2	11.0		Syenite	1.2	10.0	8.8	13.7	2.1	Eluvial						
2370	56	2344	212	440.3	1.8	438.5	16.2	424.1	14.4	20.2	Syenite	6.0	15.7	9.7	47.6	8.7	Alluvial	10.2	11.8	1.6	83.7	15.3	Alluvial
2371	56	522	190	439.2	3.4	435.8	11.5	427.7	8.1	18.0	Gabbro	5.8	18.0	12.2	23.2	2.1	Eluvial/Alluvial						
2372	56	1243	110	439.0	4.0	435.0	10.5	428.5	6.5	22.0	Gabbro	9.0	21.0	22.9	1.5		Eluvial/Alluvial	10.0	10.7	0.7	56.6	9.0	Alluvial
2373	56	2070	87	438.1	2.9	435.2	11.5	426.6	8.6	17.6	Gabbro	5.9	17.5	11.6	22.5	1.9	Eluvial/Alluvial						
2374	56	1241	107	437.0	3.2	4																	











**Appendix 2-10 Quantity Mineralogical Analysis of  
Usual and Check Samples**



**Appendix 2-10 Quantity Mineralgical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after siving (-1.0 mm) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
1	MJBK-38	26_6_1	56.00	57.00	6.600	90.0	45.00	45.00	6.61	2.000	1.900	0.050	-	0.010	0.040
2	MJBK-38	26_6_2	57.00	58.00	9.700	380.0	35.50	35.50	7.60	8.390	7.980	0.180	-	0.020	0.110
3	MJBK-38	26_6_3	58.00	59.00	6.600	130.0	32.50	32.50	4.25	2.580	2.370	0.090	-	0.010	0.040
4	MJBK-38	26_6_4	59.00	60.00	5.300	255.0	32.00	32.00	5.71	8.590	8.130	0.240	-	0.020	0.090
5	MJBK-38	26_6_5	60.00	61.00	7.900	1870.0	29.60	29.60	9.00	71.970	69.330	1.360	-	tr	0.800
6	MJBK-38	26_6_6	61.00	62.00	6.100	1675.0	39.20	39.20	19.76	138.420	133.930	2.450	-	tr	1.330
7	MJBK-38	26_6_7	62.00	63.00	6.200	65.0	32.50	32.50	3.09	0.900	0.810	0.030	-	tr	0.020
8	MJBK-38	26_6_8	63.00	64.00	8.000	28.2	28.20	28.20	2.76	0.340	0.320	0.010	-	tr	0.020
9	MJBK-39	26_38_1	29.50	30.40	8.100	105.0	26.57	26.57	0.91	0.440	0.330	0.030	-	tr	0.000
10	MJBK-39	26_38_2	30.40	31.50	9.500	195.0	37.20	37.20	0.42	0.230	0.190	0.010	-	tr	0.000
11	MJBK-39	26_38_3	31.50	32.50	7.500	705.0	44.00	44.00	0.08	0.170	0.090	0.010	-	tr	0.000
12	MJBK-39	26_38_4	32.50	33.50	5.400	290.0	36.42	36.42	0.02	0.030	0.020	tr	-	tr	0.000
13	MJBK-40	26_10_1	44.00	45.00	8.800	327.0	40.35	40.35	6.37	5.870	5.560	0.150	-	tr	0.060
14	MJBK-40	26_10_2	45.00	46.00	8.500	270.0	34.35	34.35	5.15	4.690	4.380	0.090	-	0.010	0.120
15	MJBK-40	26_10_3	46.00	47.00	11.000	2110.0	33.10	33.10	10.17	58.940	56.790	1.030	-	0.060	0.790
16	MJBK-40	26_10_4	47.00	48.00	9.300	2000.0	31.50	31.50	9.13	62.330	59.740	1.090	-	0.070	1.160
17	MJBK-40	26_10_5	48.00	49.00	8.100	14.5	14.47	14.47	1.44	0.180	0.160	tr	-	tr	0.010
18	MJBK-40	26_10_6	49.00	50.00	6.900	14.0	13.80	13.80	2.42	0.360	0.110	tr	-	tr	0.230
19	MJBK-41	22_42_1	32.00	33.00	8.500	130.0	32.20	32.20	0.65	0.310	0.250	0.010	-	tr	0.000
20	MJBK-41	22_42_2	33.00	34.00	8.600	222.0	27.70	27.70	0.42	0.390	0.310	0.020	-	tr	0.000
21	MJBK-41	22_42_3	34.00	35.00	7.600	180.0	45.00	45.00	0.15	0.080	0.040	0.010	-	tr	0.000
22	MJBK-41	22_42_4	35.00	36.00	8.500	245.0	30.50	30.50	6.33	5.980	0.020	tr	-	tr	5.920
23	MJBK-42	22_38_1	36.00	37.00	7.100	260.0	32.20	32.20	0.72	0.820	0.720	0.020	-	0.010	0.040
24	MJBK-42	22_38_2	37.00	38.10	9.100	270.0	33.20	33.20	1.10	0.980	0.870	0.020	-	0.010	0.020
25	MJBK-42	22_38_3	38.10	39.00	9.600	370.0	45.65	45.65	1.06	0.890	0.820	0.020	-	tr	0.010
26	MJBK-42	22_38_4	39.00	40.00	9.300	100.0	25.32	25.32	0.33	0.140	0.130	0.010	-	tr	0.000
27	MJBK-42	22_38_5	40.00	40.80	5.100	330.0	41.10	41.10	0.88	1.390	1.210	0.050	-	0.010	0.030
28	MJBK-42	22_38_6	40.80	41.90	7.500	1280.0	40.00	40.00	0.53	2.260	1.920	0.060	-	tr	0.080
29	MJBK-42	22_38_7	41.90	42.50	6.100	420.0	26.50	26.50	0.23	0.600	0.440	0.040	-	tr	0.000
30	MJBK-42	22_38_8	42.50	43.50	6.800	430.0	26.90	26.90	0.12	0.280	0.210	0.020	-	tr	0.000
31	MJBK-43	22_34_1	38.00	39.00	8.200	143.0	35.70	35.70	2.98	1.460	1.370	0.020	-	tr	0.030
32	MJBK-43	22_34_2	39.00	40.00	6.700	335.0	41.50	41.50	3.19	3.840	3.640	0.060	-	0.010	0.060
33	MJBK-43	22_34_3	40.00	41.00	11.700	2156.0	33.50	33.50	4.73	23.780	22.830	0.350	-	0.050	0.250
34	MJBK-43	22_34_4	41.00	42.50	16.800	9800.0	38.10	38.10	4.23	61.130	58.240	0.720	-	0.140	1.010
35	MJBK-43	22_34_5	42.50	43.70	13.700	7665.0	30.05	30.05	3.64	67.770	64.420	0.740	-	0.190	1.300
36	MJBK-43	22_34_6	43.70	44.50	8.500	430.0	27.00	27.00	0.78	1.460	1.310	0.040	-	tr	0.060
37	MJBK-43	22_34_7	44.50	45.50	9.100	630.0	39.70	39.70	3.59	6.260	5.980	0.080	-	tr	0.070
38	MJBK-44	22-10-1	34.00	35.50	11.100	530.0	33.20	33.20	0.30	0.430	0.220	0.030	-	0.020	0.130
39	MJBK-44	22-10-2	35.50	37.00	11.100	912.0	28.50	28.50	0.32	0.920	0.370	0.040	-	0.030	0.290
40	MJBK-44	22-10-3	37.00	38.50	12.200	650.0	40.60	40.60	0.48	0.630	0.280	0.030	-	0.040	0.200



**Appendix 2-10 Quantity Mineralgical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after vining (-1.0 m) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
41	MJBK-44	22-10-4	38.50	39.50	8.900	367.0	45.50	45.50	0.40	0.360	0.210	0.020	-	0.010	0.070
42	MJBK-44	22-10-5	39.50	40.60	10.500	650.0	40.20	40.20	0.39	0.600	0.280	0.020	-	0.030	0.190
43	MJBK-44	22-10-6	42.20	43.50	9.500	512.0	31.25	31.25	0.52	0.900	0.550	0.020	-	0.030	0.230
44	MJBK-44	22-10-7	43.50	45.00	13.500	265.0	33.10	33.10	4.01	2.380	2.160	0.050	-	0.020	0.070
45	MJBK-44	22-10-8	45.00	46.50	10.600	120.0	30.00	30.00	4.99	1.880	1.780	0.040	-	tr	0.050
46	MJBK-44	22-10-9	46.50	47.50	9.500	88.0	43.75	43.75	6.97	1.480	1.400	0.030	-	tr	0.020
47	MJBK-44	22-10-10	47.50	48.30	8.400	110.0	27.20	27.20	5.61	2.700	2.510	0.190	-	0.020	0.080
48	MJBK-44	22-10-11	48.30	49.20	7.900	2130.0	33.10	33.10	6.48	52.780	50.750	0.900	-	0.090	0.920
49	MJBK-44	22-10-12	49.20	49.50	5.100	585.0	36.50	36.50	11.17	35.100	33.850	0.630	-	0.030	0.400
50	MJBK-44	22-10-13	49.50	50.40	9.900	1605.0	37.50	37.50	9.49	41.030	39.470	0.780	-	0.040	0.560
51	MJBK-44	22-10-14	50.40	51.60	9.100	2320.0	36.50	36.50	9.85	68.800	66.430	1.050	-	0.070	0.980
52	MJBK-44	22-10-15	51.60	53.00	9.700	47.00	45.80	45.80	1.77	0.190	0.130	tr	-	tr	0.320
53	MJBK-44	22-10-16	53.00	54.00	10.400	255.00	31.70	31.70	3.60	2.780	1.970	0.040	-	tr	0.550
54	MJBK-44	22-10-17	54.00	55.50	11.400	260.00	32.70	32.70	11.22	7.830	5.590	0.050	-	tr	1.600
55	MJBK-44	22-10-18	55.50	57.00	12.100	168.00	42.00	42.00	6.67	2.200	1.420	0.030	-	tr	0.720
56	MJBK-44	22-10-19	57.00	58.50	12.700	245.00	30.90	30.90	3.30	2.440	1.830	0.040	-	tr	0.420
57	MJBK-44	22-10-20	58.50	60.00	10.600	210.00	39.10	39.10	4.29	2.170	2.000	0.050	-	tr	0.000
58	MJBK-45	22_6_1	51.00	52.00	8.300	150.00	37.10	37.10	5.90	2.870	2.730	0.070	-	tr	0.030
59	MJBK-45	22_6_2	52.00	53.00	8.600	195.00	36.15	36.15	1.55	0.970	0.920	0.010	-	tr	0.020
60	MJBK-45	22_6_3	53.00	53.80	6.600	1950.00	30.50	30.50	4.34	42.040	40.200	0.770	-	0.970	0.560
61	MJBK-45	22_6_4	53.80	54.90	8.500	1470.00	34.50	34.50	6.56	32.880	31.780	0.530	-	0.100	0.250
62	MJBK-45	22_6_5	54.90	55.90	11.300	785.00	36.90	36.90	9.10	17.130	16.400	0.300	-	0.030	0.310
63	MJBK-45	22_6_6	55.90	57.00	5.500	18.07	18.07	18.07	1.00	0.180	0.150	tr	-	tr	0.010
64	MJBK-45	22_6_7	57.00	58.00	7.100	24.0	23.70	23.70	0.77	0.110	0.100	tr	-	tr	0.000
65	MJBK-46	18-38-1	18.00	19.00	11.100	130.0	32.70	32.70	0.26	0.090	0.060	tr	-	tr	0.000
66	MJBK-46	18-38-2	19.00	19.90	10.100	170.0	42.74	42.74	0.14	0.060	0.040	tr	-	tr	0.000
67	MJBK-46	18-38-3	19.90	21.00	9.600	1810.0	28.50	28.50	0.05	0.330	0.060	tr	-	tr	0.000
68	MJBK-46	18-38-4	21.00	22.00	8.850	1553.0	37.00	37.00	0.08	0.380	0.240	tr	-	tr	0.000
69	MJBK-46	18-38-5	22.00	23.50	9.100	598.0	37.20	37.20	0.06	0.100	tr	tr	0.000	tr	0.000
70	MJBK-47	18-34-1	30.00	31.00	9.800	105.0	26.50	26.50	7.30	2.950	0.170	0.010	-	tr	2.710
71	MJBK-47	18-34-2	31.00	32.00	8.300	165.0	41.10	41.10	14.69	7.110	0.070	0.020	-	tr	6.980
72	MJBK-47	18-34-3	32.00	33.00	9.600	140.0	35.49	35.49	7.46	3.070	0.080	0.010	-	tr	2.940
73	MJBK-47	18-34-4	33.00	34.00	10.800	300.0	37.50	37.50	2.70	4.330	0.240	0.020	-	tr	3.930
74	MJBK-47	18-34-5	34.00	35.00	6.500	135.0	33.95	33.95	2.92	1.740	0.030	tr	-	tr	1.610
75	MJBK-47	18-34-6	35.00	36.00	5.800	159.0	39.85	39.85	0.04	0.030	0.020	tr	-	tr	0.000
76	MJBK-48	18-30-1	36.60	38.00	12.500	320.0	39.90	39.90	2.04	1.310	1.230	0.030	-	tr	0.000
77	MJBK-48	18-30-2	38.00	39.00	11.500	890.00	28.00	28.00	2.32	6.410	6.020	0.070	-	tr	0.140
78	MJBK-48	18-30-3	39.00	39.50	7.650	117.00	33.50	33.50	1.52	0.690	0.630	0.020	-	tr	0.000
79	MJBK-48	18-30-4	39.50	40.50	12.700	2790.00	43.00	43.00	4.51	23.040	21.760	0.410	-	tr	0.360
80	MJBK-48	18-30-5	40.50	41.60	9.800	250.00	31.54	31.54	0.60	0.480	0.440	0.020	-	tr	0.000



**Appendix 2-10 Quantity Mineralgical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after drying (-1.0 m) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
81	MJBK-48	18-30-6	41.60	42.60	10.650	198.00	36.00	36.00	2.28	1.180	1.070	0.030	-	tr	0.000
82	MJBK-48	18-30-7	42.60	43.60	12.250	2626.00	41.00	41.00	3.48	18.200	16.730	0.340	-	tr	0.320
83	MJBK-48	18-30-8	43.60	44.50	8.400	1440.00	44.50	44.50	3.99	15.370	14.250	0.420	-	tr	0.270
84	MJBK-48	18-30-9	44.50	45.50	11.950	765.00	35.92	35.92	1.09	1.940	1.730	0.070	-	tr	0.000
85	MJBK-48	18-30-10	45.50	46.50	12.000	1615.00	37.79	37.79	0.78	2.780	2.350	0.110	-	0.070	0.000
86	MJBK-48	18-30-11	46.50	47.50	11.400	865.00	40.50	40.50	0.56	1.050	0.880	0.004	-	0.020	0.000
87	MJBK-48	18-30-12	47.50	48.40	10.450	1345.00	42.00	42.00	0.51	1.560	1.220	0.080	-	0.030	0.000
88	MJBK-48	18-30-13	48.40	48.60	3.800	350.00	42.50	42.50	2.23	4.830	0.150	0.004	-	0.170	0.000
89	MJBK-48	18-30-14	48.60	49.10	8.150	2215.00	35.50	35.50	5.16	39.500	37.130	0.690	-	tr	1.450
90	MJBK-48	18-30-15	49.10	49.50	7.600	1015.00	31.00	31.00	8.30	35.760	30.590	0.430	-	2.330	1.290
91	MJBK-48	18-30-16	49.50	50.00	5.100	131.00	33.00	33.00	0.69	0.530	0.100	tr	-	tr	0.000
92	MJBK-48	18-30-17	50.00	51.00	7.300	418.00	38.70	38.70	1.67	2.470	2.090	0.070	-	0.030	0.000
93	MJBK-49	18-26-1	37.00	38.00	8.400	195.00	35.10	35.90	0.43	0.280	0.230	0.010	-	tr	0.030
94	MJBK-49	18-26-2	38.00	39.00	8.100	425.00	27.10	27.10	2.34	4.530	3.870	0.110	-	0.020	0.330
95	MJBK-49	18-26-3	39.00	39.50	6.500	1290.00	41.90	41.90	4.83	22.880	20.220	0.400	-	tr	1.660
96	MJBK-49	18-26-4	39.50	40.70	15.750	7910.00	31.00	31.60	5.37	85.350	76.290	1.350	-	tr	5.880
97	MJBK-49	18-26-5	40.70	41.60	9.100	4530.00	36.00	36.00	4.88	67.480	60.700	1.240	-	tr	4.700
98	MJBK-49	18-26-6	41.60	42.60	10.400	2080.00	32.70	32.70	2.77	16.940	15.290	0.340	tr	tr	0.670
99	MJBK-49	18-26-7	42.60	43.60	7.900	3265.00	37.00	37.00	3.43	38.310	33.730	0.730	-	tr	2.350
100	MJBK-49	18-26-8	43.60	44.60	8.400	3245.00	37.10	37.10	3.40	35.400	31.550	0.730	-	tr	1.980
101	MJBK-49	18-26-9	44.60	45.50	6.400	1150.00	37.10	37.10	2.80	13.560	11.090	0.240	-	1.400	0.530
102	MJBK-49	18-26-10	45.50	46.80	7.400	2865.00	43.40	43.40	3.19	28.460	25.160	0.760	-	tr	1.250
103	MJBK-49	18-26-11	46.80	48.00	7.700	2000.00	31.45	31.45	3.52	29.070	25.930	0.540	-	tr	1.820
104	MJBK-49	18-26-12	48.00	49.10	6.350	2185.00	35.40	35.40	7.23	70.280	62.890	1.260	-	tr	4.180
105	MJBK-49	18-26-13	49.10	50.10	4.500	1480.00	45.70	45.70	8.46	60.880	54.910	0.830	-	tr	4.390
106	MJBK-49	18-26-14	50.10	51.00	11.600	1474.00	43.10	43.10	4.41	13.000	11.560	0.280	-	tr	0.800
107	MJBK-49	18-26-15	51.00	51.70	6.400	1725.00	40.22	40.22	7.99	53.540	47.850	0.870	-	tr	3.950
108	MJBK-49	18-26-16	51.70	52.40	6.200	2220.00	34.60	34.60	7.20	74.510	65.400	0.880	-	tr	7.240
109	MJBK-49	18-26-17	52.40	53.00	4.150	102.00	38.00	38.00	2.99	1.930	1.710	0.020	-	tr	0.160
110	MJBK-49	18-26-18	53.00	54.00	7.500	240.00	30.00	30.00	0.81	0.870	0.740	0.010	-	tr	0.100
111	MJBK-50	18-18-1	36.00	37.00	8.100	112.00	28.00	28.00	2.71	1.340	1.270	0.020	-	tr	0.000
112	MJBK-50	18-18-2	37.00	38.00	7.400	560.00	35.00	35.00	3.75	8.110	7.700	0.190	-	tr	0.000
113	MJBK-50	18-18-3	38.00	38.50	6.300	1320.00	40.50	40.50	3.71	19.190	18.260	0.360	-	tr	0.000
114	MJBK-50	18-18-4	38.50	39.60	9.400	4720.00	35.70	35.70	3.56	50.070	47.400	0.900	tr	tr	1.130
115	MJBK-50	18-18-5	39.60	40.00	6.200	2965.00	45.50	45.50	12.70	133.480	127.490	2.100	-	tr	2.840
116	MJBK-50	18-18-6	40.00	41.00	10.500	6413.00	39.20	39.20	10.38	161.730	155.030	2.340	-	tr	3.120
117	MJBK-50	18-18-7	41.00	42.00	9.400	3673.00	42.70	42.70	7.25	66.340	63.420	0.920	tr	tr	1.370
118	MJBK-50	18-18-8	42.00	43.10	8.600	1320.00	40.70	40.70	2.27	8.560	7.730	0.200	-	tr	0.000
119	MJBK-50	18-18-9	43.10	44.10	7.900	2900.00	45.00	45.00	3.35	27.330	25.130	0.610	tr	0.120	0.000
120	MJBK-50	18-18-10	44.10	45.10	7.700	3020.00	45.60	45.60	5.27	45.330	42.750	0.820	-	tr	0.000



**Appendix 2-10 Quantity Mineralgical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after vining (-1.0 m) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
121	MJBK-50	18-18-11	45.10	46.20	9.700	4745.00	37.00	37.00	2.13	28.160	26.180	0.590	-	0.130	0.000
122	MJBK-50	18-18-12	46.20	47.00	6.200	2675.00	41.20	41.20	3.02	31.630	29.430	0.730	-	tr	0.000
123	MJBK-50	18-18-13	47.00	48.00	7.650	4855.00	38.00	38.00	2.63	43.920	41.420	1.000	tr	tr	0.000
124	MJBK-50	18-18-14	48.00	49.00	9.650	3910.00	31.50	31.50	2.62	33.700	31.640	0.510	-	tr	0.000
125	MJBK-50	18-18-15	49.00	50.00	8.500	3600.00	41.20	41.20	4.59	47.180	44.310	0.720	-	tr	1.130
126	MJBK-50	18-18-16	50.00	51.00	10.500	4705.00	37.10	37.10	3.10	37.440	34.910	0.540	-	tr	0.970
127	MJBK-50	18-18-17	51.00	52.00	5.050	2540.00	39.20	39.20	4.81	61.720	58.510	1.280	-	tr	1.540
128	MJBK-50	18-18-18	52.00	53.00	6.400	910.00	29.00	29.00	2.40	11.770	11.030	0.220	-	0.050	0.200
129	MJBK-50	18-18-19	53.00	54.00	7.500	2440.00	38.30	38.30	4.51	38.310	36.050	0.630	-	tr	0.610
130	MJBK-50	18-18-20	54.00	54.60	7.900	3405.00	40.50	40.50	3.15	33.530	32.140	0.320	-	tr	0.320
131	MJBK-50	18-18-21	54.60	55.80	11.100	5845.00	44.20	44.20	7.07	84.230	80.420	0.890	-	tr	1.910
132	MJBK-50	18-18-22	55.80	57.20	11.700	6035.00	35.40	35.40	5.84	92.970	88.040	1.270	-	tr	2.390
133	MJBK-50	18-18-23	57.20	58.00	5.200	838.00	39.00	39.00	0.74	3.060	2.890	0.040	tr	tr	0.080
134	MJBK-50	18-18-24	58.00	59.00	9.300	1185.00	36.21	36.21	0.30	1.060	0.810	0.020	-	tr	0.000
135	MJBK-51	18-14-1	35.00	36.00	12.000	653.00	40.90	40.90	1.05	1.400	0.330	0.020	-	0.120	0.800
136	MJBK-51	18-14-2	36.00	37.00	13.100	1010.00	33.10	33.10	0.77	1.790	0.350	0.020	-	0.140	1.070
137	MJBK-51	18-14-3	37.00	38.00	10.000	263.00	33.00	33.00	0.72	0.570	0.180	0.020	-	0.050	0.290
138	MJBK-51	18-14-4	38.00	39.30	11.300	335.00	41.95	41.95	1.27	0.900	0.440	0.030	-	0.050	0.320
139	MJBK-51	18-14-5	39.30	40.00	7.100	245.00	30.65	30.65	1.14	1.280	0.730	0.040	-	0.040	0.340
140	MJBK-51	18-14-6	40.00	41.00	9.700	1635.00	37.50	37.50	0.83	3.730	1.890	0.130	-	0.140	1.260
141	MJBK-51	18-14-7	41.00	42.00	8.900	1825.00	28.45	28.45	0.55	3.960	2.450	0.140	-	0.210	1.080
142	MJBK-51	18-14-8	42.00	43.00	8.800	1535.00	35.40	35.40	0.88	0.340	3.100	0.100	-	0.140	0.740
143	MJBK-51	18-14-9	43.00	44.00	9.000	2295.00	35.70	35.70	0.66	4.710	2.860	0.140	-	0.200	1.290
144	MJBK-51	18-14-10	44.00	45.00	9.900	1580.00	36.47	36.47	1.81	7.920	5.910	0.220	-	0.130	1.310
145	MJBK-51	18-14-11	45.00	46.00	10.000	2605.00	40.50	40.50	1.01	6.500	4.700	0.190	-	0.200	0.840
146	MJBK-51	18-14-12	46.00	46.80	6.500	1575.00	36.02	36.02	0.89	5.990	4.040	0.130	-	0.180	1.300
147	MJBK-51	18-14-13	46.80	48.00	11.600	2215.00	33.90	33.90	0.99	5.580	4.170	0.170	-	0.180	0.700
148	MJBK-51	18-14-14	48.00	49.00	10.500	3175.00	37.45	37.45	0.87	7.020	4.520	0.160	-	0.330	1.360
149	MJBK-51	18-14-15	49.00	50.00	10.900	4703.00	37.25	37.25	0.99	11.470	8.690	0.230	-	0.340	1.260
150	MJBK-51	18-14-16	50.00	51.40	11.400	4455.00	34.30	34.30	1.99	22.670	20.280	0.400	-	0.280	0.570
151	MJBK-51	18-14-17	51.40	53.00	8.900	1307.00	41.00	41.00	0.37	1.320	0.900	0.040	-	0.050	0.000
152	MJBK-51	18-14-18	53.00	54.00	8.700	915.00	28.20	28.20	0.16	0.600	0.370	0.040	-	tr	0.000
153	MJBK-52	18-10-1	37.30	38.50	10.500	50.00	25.00	25.00	2.30	0.440	0.390	0.010	-	tr	0.000
154	MJBK-52	18-10-2	38.50	39.30	9.400	27.30	27.32	27.32	3.16	0.340	0.290	0.010	-	tr	0.000
155	MJBK-52	18-10-3	39.30	40.50	13.800	542.00	34.10	34.10	3.50	4.030	3.740	0.130	-	tr	0.000
156	MJBK-52	18-10-4	40.50	41.50	12.900	1962.00	30.50	30.50	3.86	19.250	18.050	0.450	-	tr	0.470
157	MJBK-52	18-10-5	41.50	42.40	11.300	2115.00	33.10	33.10	3.92	22.170	20.980	0.400	-	tr	0.360
158	MJBK-52	18-10-6	42.40	43.60	8.800	3235.00	37.70	37.70	5.07	49.440	46.410	0.780	-	0.100	1.460
159	MJBK-52	18-10-7	43.60	44.80	8.700	390.00	36.70	36.70	5.87	7.170	6.740	0.120	-	0.040	0.180
160	MJBK-52	18-10-8	44.80	46.40	12.800	3530.00	28.00	28.00	7.88	77.610	74.160	1.180	-	0.100	1.480



**Appendix 2-10 Quantity Mineralgical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after drying (-1.0 mm) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucosene (kg/t)	the others (kg/t)
161	MJBK-52	18-10-9	46.40	46.80	5.100	145.00	35.90	35.90	5.97	4.730	4.400	0.090	-	tr	0.160
162	MJBK-52	18-10-10	46.80	48.00	14.600	2965.00	34.30	34.30	2.40	14.210	12.790	0.470	-	0.120	0.530
163	MJBK-52	18-10-11	48.00	49.00	11.900	2496.00	39.02	39.02	2.42	13.010	11.660	0.480	-	0.110	0.590
164	MJBK-52	18-10-12	49.00	49.90	10.100	2165.00	33.50	33.50	3.13	20.030	18.110	0.700	-	0.190	0.570
165	MJBK-52	18-10-13	49.90	50.20	6.300	1475.00	34.50	34.50	3.50	23.750	21.720	0.750	-	0.200	0.530
166	MJBK-52	18-10-14	50.20	51.50	10.300	1080.00	32.70	32.70	1.45	4.650	4.230	0.130	-	0.040	0.170
167	MJBK-52	18-10-15	51.50	53.00	10.300	405.00	37.50	37.50	0.30	0.310	0.250	0.020	-	0.010	0.000
168	MJBK-53	26_2_1	54.00	55.00	7.800	230.00	29.10	29.10	5.68	5.760	3.140	0.080	-	tr	2.460
169	MJBK-53	26_2_2	55.00	56.00	5.400	212.00	26.45	26.45	4.91	7.290	6.920	0.130	-	tr	0.120
170	MJBK-53	26_2_3	56.00	56.50	7.400	2310.00	36.80	36.80	10.91	92.550	88.560	1.870	-	0.080	1.270
171	MJBK-53	26_2_4	56.50	57.10	5.300	1575.00	36.77	36.77	11.22	90.680	87.450	1.780	-	0.080	0.810
172	MJBK-53	26_2_5	57.10	58.00	7.300	367.00	45.55	45.55	8.21	9.060	8.410	0.180	-	0.020	0.300
173	MJBK-53	26_2_6	58.00	59.00	9.100	290.00	36.57	36.57	6.93	6.040	5.510	0.140	-	0.020	0.290
174	MJBK-54	22_2_1	39.00	40.00	5.900	315.00	39.10	39.10	0.42	0.570	0.340	0.010	-	0.030	0.120
175	MJBK-54	22_2_2	40.00	41.00	7.600	350.00	43.65	43.65	0.61	0.640	0.330	0.020	-	0.020	0.110
176	MJBK-54	22_2_3	41.00	42.00	12.600	73.00	36.50	36.50	0.89	0.140	0.100	0.010	-	tr	0.020
177	MJBK-54	22_2_4	42.00	43.00	9.100	38.00	37.92	37.92	3.21	0.350	0.330	0.010	-	tr	0.000
178	MJBK-54	22_2_5	43.00	43.80	5.200	140.00	35.50	35.50	0.33	0.250	0.230	0.010	-	tr	0.000
179	MJBK-54	22_2_6	43.80	44.50	6.700	55.00	27.50	27.50	1.16	0.350	0.300	0.010	-	tr	0.020
180	MJBK-54	22_2_7	49.00	50.00	9.300	120.00	30.00	30.00	4.22	1.820	1.700	0.040	-	0.010	0.050
181	MJBK-54	22_2_8	50.00	51.00	8.400	85.00	42.50	42.50	5.71	1.360	1.300	0.030	-	tr	0.020
182	MJBK-54	22_2_9	51.00	52.00	9.700	68.00	34.00	34.00	9.15	1.890	0.090	0.010	-	tr	1.770
183	MJBK-54	22_2_10	52.00	53.00	6.500	78.00	39.00	39.00	9.07	2.790	0.150	0.020	-	tr	2.580
184	MJBK-54	22_2_11	53.00	54.30	12.500	206.00	26.04	26.04	2.88	1.820	1.690	0.040	-	tr	0.050
185	MJBK-54	22_2_12	54.30	55.30	16.500	5657.00	33.20	33.20	9.15	94.490	89.840	1.960	-	0.100	1.820
186	MJBK-54	22_2_13	55.30	56.20	9.500	3450.00	26.90	26.90	7.66	103.410	98.960	2.160	-	tr	1.220
187	MJBK-54	22_2_14	56.20	56.70	3.400	373.00	46.50	46.50	7.75	18.280	17.550	0.420	-	0.020	0.090
188	MJBK-54	22_2_15	56.70	57.60	7.200	1635.00	38.10	38.10	15.13	90.180	87.610	1.430	-	tr	0.660
189	MJBK-54	22_2_16	57.60	58.50	7.600	140.00	35.00	35.70	4.33	2.230	2.120	0.040	-	tr	0.060
190	MJBK-54	22_2_17	58.50	59.50	7.100	145.00	36.00	36.90	5.23	2.890	2.740	0.070	-	tr	0.040
191	MJBK-55	18_6_1	48.00	49.00	7.400	92.00	46.00	46.00	8.72	2.360	2.250	0.050	-	0.010	0.030
192	MJBK-55	18_6_2	49.00	50.00	7.900	130.00	32.50	32.50	5.95	3.010	2.860	0.070	-	0.010	0.050
193	MJBK-55	18_6_3	50.00	51.00	7.700	170.00	42.50	42.50	3.61	1.880	1.740	0.040	-	0.010	0.020
194	MJBK-55	18_6_4	51.00	52.00	8.600	160.00	40.00	40.00	11.15	5.190	0.750	0.030	-	tr	4.320
195	MJBK-55	18_6_5	52.00	53.00	7.500	1105.00	34.18	34.18	1.95	8.400	7.330	0.430	-	0.080	0.120
196	MJBK-55	18_6_6	53.00	54.00	8.700	340.00	42.20	42.20	9.20	8.520	3.070	0.100	-	tr	5.190
197	MJBK-55	18_6_7	54.00	55.00	6.500	395.00	36.74	36.74	5.53	9.150	8.450	0.230	-	0.070	0.110
198	MJBK-55	18_6_8	55.00	56.00	5.500	325.00	40.80	40.80	7.41	10.730	4.060	0.160	-	0.040	5.790
199	MJBK-55	18_6_9	56.00	57.00	5.700	329.00	40.44	40.44	5.63	8.040	5.310	0.190	-	tr	2.430
200	MJBKS-26	2A-4-4	14.60	15.60	4.100	88.00	43.40	43.40	1.34	0.660	0.490	0.710	-	0.010	0.750



**Appendix 2-10 Quantity Mineralogical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after vining (-1.0 m) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
201	MJBKS-26	2A-4-5	15.60	16.60	2.400	85.00	42.50	42.50	4.91	4.090	3.220	0.120	-	0.340	0.130
202	MJBKS-26	2A-4-6	16.60	17.60	4.300	130.00	32.93	32.93	2.75	2.520	2.170	0.130	-	0.020	0.090
203	MJBKS-26	2A-4-7	17.60	18.60	4.000	73.00	36.50	36.50	3.88	1.940	1.550	0.100	-	0.010	0.040
204	MJBKS-26	2A-4-8	18.60	20.00	3.700	100.00	25.00	25.00	0.49	0.530	0.340	0.030	-	tr	0.000
205	MJBKS-27	2A-8-4	18.00	19.00	3.600	58.00	29.00	29.00	2.84	1.580	1.420	0.050	-	0.010	0.070
206	MJBKS-27	2A-8-5	19.00	20.00	3.300	110.00	27.50	27.50	3.21	3.890	3.500	0.120	-	0.020	0.160
207	MJBKS-27	2A-8-6	20.00	20.70	2.900	179.00	44.50	44.50	7.17	9.940	9.100	0.290	-	0.040	0.400
208	MJBKS-27	2A-8-7	20.70	22.00	4.200	352.00	44.00	44.00	5.86	11.160	10.130	0.400	-	0.070	0.420
209	MJBKS-27	2A-8-8	22.00	23.00	3.800	215.00	27.85	27.85	4.46	9.060	8.250	0.300	-	0.080	0.230
210	MJBKS-28	3Г-0-1	23.00	24.00	1.000	20.45	20.45	20.45	0.76	0.760	0.600	0.030	-	0.100	0.000
211	MJBKS-28	3Г-0-2	24.00	25.00	1.100	21.60	21.60	21.60	0.76	0.690	0.610	0.020	-	0.010	0.000
212	MJBKS-28	3Г-0-3	25.00	26.00	1.750	385.0	35.34	35.34	1.15	7.160	6.600	0.220	-	0.060	0.000
213	MJBKS-28	3Г-0-4	26.00	27.00	1.400	415.0	38.00	38.00	1.22	9.520	8.660	0.310	-	0.080	0.000
214	MJBKS-28	3Г-0-5	27.00	28.00	1.800	437.0	41.00	41.00	1.23	7.280	5.390	0.240	-	0.060	0.000
215	MJBKS-28	3Г-0-6	28.00	29.00	4.300	1180.0	37.00	37.00	0.99	7.340	6.450	0.190	-	0.110	0.370
216	MJBKS-28	3Г-0-7	29.00	30.00	2.500	630.0	39.75	39.75	1.73	10.970	9.950	0.220	-	0.100	0.440
217	MJBKS-28	3Г-0-8	30.00	31.00	3.550	652.0	41.10	41.10	1.61	7.190	6.390	0.220	-	0.040	0.280
218	MJBKS-28	3Г-0-9	31.00	32.00	3.600	142.0	35.60	35.60	0.69	0.760	0.630	0.030	-	0.020	0.000
219	MJBKS-29	3Г-8-5	26.00	26.90	2.900	55.0	27.50	27.50	2.74	1.890	1.740	0.090	tr	tr	0.000
220	MJBKS-29	3Г-8-6	26.90	27.80	3.100	124.0	31.00	31.00	3.43	4.420	4.130	0.180	tr	0.020	0.000
221	MJBKS-29	3Г-8-7	27.80	29.00	4.850	2266.0	35.70	35.70	4.24	54.490	52.610	1.700	tr	0.200	0.000
222	MJBKS-29	3Г-8-8	29.00	30.20	4.400	1925.0	31.00	31.00	3.22	45.440	42.760	1.410	tr	0.210	0.000
223	MJBKS-29	3Г-8-9	30.20	31.10	2.500	152.0	38.00	38.00	4.04	6.460	6.020	0.240	tr	0.030	0.000
224	MJBKS-29	3Г-8-10	31.10	32.00	4.050	229.0	28.55	28.55	4.08	4.550	4.260	0.140	tr	0.020	0.000
225	MJBKS-29	3Г-8-11	32.00	32.70	2.900	1035.0	32.00	32.00	5.68	63.350	58.780	1.900	tr	0.220	0.890
226	MJBKS-29	3Г-8-12	32.70	33.50	3.500	1855.0	29.00	29.00	4.21	76.940	72.010	1.830	tr	0.270	1.850
227	MJBKS-29	3Г-8-13	33.50	34.20	2.500	1435.0	44.90	44.90	9.20	117.610	110.580	3.200	tr	0.260	2.560
228	MJBKS-29	3Г-8-14	34.20	35.50	5.500	969.0	30.30	30.30	4.56	26.510	25.060	0.350	-	0.090	0.750
229	MJBKS-29	3Г-8-15	35.50	35.70	2.000	560.0	34.50	34.50	6.44	52.270	48.700	1.380	-	0.160	1.540
230	MJBKS-29	3Г-8-16	35.70	36.00	1.700	509.0	32.00	32.00	10.39	96.280	90.760	1.590	-	0.190	2.990
231	MJBKS-29	3Г-8-17	36.00	37.00	3.600	155.0	38.20	38.20	0.79	0.820	0.770	0.020	-	tr	0.000
232	MJBKS-29	3Г-8-18	37.00	38.00	4.300	322.0	40.70	40.70	0.49	0.900	0.840	0.020	-	tr	0.000
233	MJBKS-29	3Г-8-19	38.00	39.00	4.900	514.0	32.20	32.20	0.04	0.130	0.100	tr	-	tr	0.000
234	MJBKS-30	3A-(4)-1	29.30	30.30	4.900	45.0	44.72	44.72	3.06	0.620	0.520	0.030	-	0.010	0.000
235	MJBKS-30	3A-(4)-2	30.30	31.30	4.200	747.0	46.60	46.60	5.27	20.110	18.620	0.800	-	0.080	0.260
236	MJBKS-30	3A-(4)-3	31.30	31.50	0.800	228.0	42.60	42.60	6.34	42.420	40.270	1.000	-	0.130	0.320
237	MJBKS-30	3A-(4)-4	31.50	32.80	5.150	1071.0	33.30	33.30	5.33	33.290	31.350	0.750	-	0.190	0.570
238	MJBKS-30	3A-(4)-5	32.80	34.00	5.600	220.0	27.50	27.50	3.25	4.640	4.290	0.160	-	0.030	0.050
239	MJBKS-30	3A-(4)-6	34.00	34.50	2.150	810.0	37.00	37.00	7.82	79.630	74.740	1.530	-	0.100	2.240
240	MJBKS-30	3A-(4)-7	34.50	35.50	4.100	650.0	40.56	40.56	7.57	29.590	27.750	0.470	-	tr	0.980



**Appendix 2-10 Quantity Mineralgical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after siving (-1.0 mm) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucosxene (kg/t)	the others (kg/t)
241	MJBKS-30	3A-(4)-8	35.50	36.50	3.600	555.0	34.87	34.87	0.23	1.020	0.750	0.070	-	tr	0.000
242	MJBKS-31	3A-0-1	30.00	31.00	5.100	124.0	31.10	31.10	2.49	1.950	1.800	0.080	-	0.010	0.000
243	MJBKS-31	3A-0-2	31.00	32.00	5.200	783.0	36.60	36.60	3.62	14.890	14.070	0.370	-	0.080	0.000
244	MJBKS-31	3A-0-3	32.00	33.50	7.000	1892.0	29.98	29.98	4.42	39.850	37.320	1.170	-	0.180	0.540
245	MJBKS-31	3A-0-4	33.50	34.50	4.000	1995.0	30.70	30.70	6.13	95.590	94.230	2.440	-	0.160	1.620
246	MJBKS-31	3A-0-5	34.50	35.50	4.300	1737.0	28.02	28.02	7.36	106.110	99.910	1.730	-	0.290	3.170
247	MJBKS-31	3A-0-6	35.50	36.50	3.200	240.0	30.10	30.10	1.59	3.960	3.790	0.040	-	0.030	0.080
248	MJBKS-31	3A-0-7	36.50	37.50	3.500	190.0	45.75	45.75	0.78	0.910	0.730	0.010	-	0.070	0.000
249	MJBKS-32	3A-4-1	27.50	28.50	3.900	93.0	46.50	46.50	4.68	2.400	2.220	0.090	-	0.010	0.040
250	MJBKS-32	3A-4-2	28.50	29.50	3.800	132.0	33.00	33.00	2.36	2.480	2.270	0.080	-	0.010	0.000
251	MJBKS-32	3A-4-3	29.50	30.00	2.300	603.0	37.90	37.90	3.99	27.600	25.940	0.970	-	0.140	0.000
252	MJBKS-32	3A-4-4	30.00	30.30	1.250	20.8	20.84	20.84	1.28	1.020	0.900	0.040	-	0.010	0.000
253	MJBKS-32	3A-4-5	30.30	31.00	2.700	415.0	38.50	38.50	3.52	14.050	13.170	0.480	-	0.120	0.130
254	MJBKS-32	3A-4-6	31.00	32.20	5.300	170.0	42.74	42.74	4.91	3.680	3.400	0.130	-	0.020	0.040
255	MJBKS-32	3A-4-7	32.20	33.50	5.000	645.0	40.80	40.80	5.35	16.920	15.900	0.470	-	0.130	0.220
256	MJBKS-32	3A-4-8	33.50	34.30	3.450	2175.0	34.00	34.00	8.81	163.360	155.750	2.970	-	0.560	3.150
257	MJBKS-32	3A-4-9	34.30	35.20	3.550	2085.0	32.50	32.50	6.21	112.220	107.160	2.350	-	0.360	1.630
258	MJBKS-32	3A-4-10	35.20	36.00	3.600	356.0	43.75	43.75	3.57	8.070	7.530	0.110	-	0.330	0.280
259	MJBKS-32	3A-4-11	36.00	37.00	3.800	368.0	45.82	45.82	0.26	0.550	0.460	0.030	-	tr	0.000
260	MJBKS-33	3A-8-1	21.50	22.50	4.200	55.0	41.37	41.37	4.70	1.490	0.970	0.040	-	0.030	0.020
261	MJBKS-33	3A-8-2	22.50	23.50	3.600	48.0	48.00	48.00	4.94	1.370	1.260	0.040	-	0.010	0.030
262	MJBKS-33	3A-8-3	23.50	24.50	4.400	150.0	37.60	37.60	5.42	4.910	4.620	0.150	-	0.010	0.060
263	MJBKS-33	3A-8-4	24.50	25.70	4.100	109.0	27.30	27.30	2.75	2.650	2.440	0.090	-	0.010	0.070
264	MJBKS-33	3A-8-5	25.70	27.00	4.300	260.0	32.50	32.50	3.99	6.800	6.200	0.290	-	0.018	0.070
265	MJBKS-33	3A-8-6	27.00	28.00	3.300	620.0	38.60	38.60	8.10	39.420	37.330	0.880	-	0.014	0.117
266	MJBKS-33	3A-8-7	28.00	29.00	3.200	235.00	29.30	29.30	5.48	13.740	12.160	0.500	-	tr	0.164
267	MJBKS-33	3A-8-8	29.00	30.00	2.400	70.00	35.00	35.00	1.31	1.090	0.900	0.020	-	tr	0.376
268	MJBKE-1	I_36_1	35.00	36.00	3.500	42.00	41.55	41.55	0.55	0.160	0.120	0.010	-	tr	0.100
269	MJBKE-1	I_36_2	36.00	36.70	2.300	38.70	38.70	38.70	0.40	0.170	0.130	0.010	-	tr	0.146
270	MJBKE-1	I_36_3	36.70	37.10	1.600	80.00	40.00	40.00	0.67	0.840	0.400	0.020	-	tr	0.028
271	MJBKE-1	I_36_4	37.10	38.00	3.300	160.00	40.00	40.00	0.53	0.640	0.450	0.060	-	tr	0.001
272	MJBKE-1	I_36_5	38.00	39.00	3.500	133.00	33.00	33.00	0.52	0.600	0.400	0.070	-	0.008	0.025
273	MJBKE-1	I_36_6	27.00	28.00	3.200	21.69	21.69	21.69	0.25	0.080	0.060	0.010	-	tr	0.001
274	MJBKE-1	I_36_7	28.00	29.00	2.400	25.42	25.42	25.42	1.89	0.790	0.740	0.020	tr	0.002	0.012
275	MJBKE-1	I_36_8	29.00	30.00	3.100	150.00	36.25	36.25	0.36	0.480	0.370	0.030	tr	0.003	0.015
276	MJBKE-1	I_36_9	30.00	31.00	3.200	170.00	42.50	42.50	0.40	0.500	0.380	0.040	tr	0.006	0.017
277	MJBKE-1	I_36_10	31.00	32.00	3.500	65.00	33.10	33.10	0.42	0.240	0.200	0.020	tr	0.024	0.098
278	MJBKE-1	I_36_11	32.00	33.00	3.300	43.00	43.00	43.00	0.80	0.240	0.210	0.010	tr	0.005	0.053
279	MJBKE-2	I_32_1	24.00	25.00	3.000	60.00	30.00	30.00	0.22	0.150	0.110	tr	tr	0.011	0.072
280	MJBKE-2	I_32_2	25.00	26.00	3.300	90.00	45.00	45.00	0.23	0.140	0.100	0.010	tr	0.020	0.075



**Appendix 2-10 Quantity Mineralogical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after vining (-1.0 m) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
281	MJBKE-2	I 32_3	26.00	27.00	6.200	140.00	34.62	34.62	0.13	0.080	0.030	0.010	tr	0.002	0.009
282	MJBKE-2	I 32_4	27.00	28.00	2.800	57.00	28.20	28.20	0.15	0.110	0.050	0.010	tr	0.004	0.032
283	MJBKE-2	I 32_5	28.00	29.00	2.900	55.00	28.10	28.10	0.28	0.190	0.110	0.020	tr	0.005	0.016
284	MJBKE-2	I 32_6	29.00	30.00	3.300	180.0	44.40	44.40	0.27	0.330	0.110	tr	tr	0.027	0.110
285	MJBKE-2	I 32_7	30.00	30.80	3.200	149.0	36.42	36.42	0.26	0.330	0.070	tr	-	tr	0.078
286	MJBKE-2	I 32_8	30.80	32.00	5.000	255.0	32.65	32.65	0.66	0.940	0.050	0.020	tr	0.015	0.107
287	MJBKE-2	I 32_9	32.00	33.00	3.400	115.0	28.72	28.72	0.31	0.370	0.060	0.010	-	tr	0.040
288	MJBKE-2	I 32_10	33.00	34.00	3.500	253.0	31.80	31.80	0.22	0.500	0.160	0.020	-	0.016	0.042
289	MJBKE-2	I 32_11	34.00	35.00	3.800	178.0	44.50	44.50	0.28	0.290	0.050	tr	-	0.026	0.364
290	MJBKE-2	I 32_12	35.00	36.00	2.700	190.0	34.20	34.20	0.24	0.490	0.130	0.010	-	0.024	0.153
291	MJBKE-2	I 32_13	36.00	37.00	3.200	65.0	32.50	32.50	0.36	0.230	0.090	tr	-	tr	0.236
292	MJBKE-2	I 32_14	37.00	38.20	4.400	335.0	41.20	41.20	0.38	0.700	0.070	tr	tr	0.004	0.010
293	MJBKE-2	I 32_15	38.20	39.50	4.400	565.0	35.37	35.37	0.35	1.270	0.110	0.030	tr	0.048	0.142
294	MJBKE-2	I 32_16	39.50	41.00	5.000	304.0	38.00	38.00	1.03	1.650	0.030	tr	tr	0.057	0.344
295	MJBKE-2	I 32_17	41.00	42.00	4.100	455.0	28.70	28.70	0.19	0.730	0.040	tr	tr	0.164	0.656
296	MJBKE-3	I 28_1	21.00	21.80	2.900	40.5	40.47	40.47	0.64	0.220	0.160	0.010	tr	0.112	0.786
297	MJBKE-3	I 28_2	21.80	22.60	2.700	90.0	45.00	45.00	0.66	0.490	0.230	tr	-	0.116	0.816
298	MJBKE-3	I 28_3	22.60	23.60	3.300	102.0	25.70	25.70	0.15	0.180	0.160	0.010	tr	tr	1.117
299	MJBKE-3	I 28_4	23.60	24.60	3.500	100.0	37.40	36.70	0.27	0.210	0.180	0.010	tr	0.076	0.535
300	MJBKE-4	IV 0_1	10.50	11.50	3.000	27.0	27.04	27.04	0.92	0.310	0.240	0.010	-	tr	0.226
301	MJBKE-4	IV 0_2	11.50	12.50	3.200	25.8	25.82	25.82	0.59	0.180	0.130	0.010	-	tr	0.226
302	MJBKE-4	IV 0_3	12.50	13.50	3.600	520.0	32.50	32.50	0.19	0.840	0.530	0.130	-	0.010	0.138
303	MJBKE-4	IV 0_4	13.50	14.50	3.700	615.0	38.20	38.20	0.10	0.440	0.260	tr	-	0.031	0.032
304	MJBKE-4	IV 0_5	14.50	15.50	3.100	780.0	36.70	36.70	0.02	0.140	0.140	tr	tr	0.010	0.043
305	MJBKE-5	IV (-4)_1	11.00	12.00	3.300	7.3	7.25	7.25	0.28	0.080	0.050	tr	tr	0.122	0.368
306	MJBKE-5	IV (-4)_2	12.00	13.00	3.000	7.9	7.90	7.90	0.13	0.040	0.030	tr	tr	0.253	0.673
307	MJBKE-5	IV (-4)_3	13.00	14.00	3.100	135.0	33.75	33.75	0.21	0.270	0.060	0.010	tr	0.214	1.058
308	MJBKE-5	IV (-4)_4	14.00	15.00	3.300	565.0	35.50	35.50	0.34	1.640	0.190	tr	-	tr	0.045
309	MJBKE-6	IV (-8)_1	16.50	17.50	2.300	44.5	44.45	44.45	3.06	1.330	1.170	0.070	-	tr	0.013
310	MJBKE-6	IV (-8)_2	17.50	18.30	2.500	50.0	25.00	25.00	1.78	1.420	1.220	0.070	-	0.006	0.094
311	MJBKE-6	IV (-8)_3	18.30	19.00	2.500	146.0	37.70	37.70	1.83	2.830	2.430	0.060	tr	tr	0.280
312	MJBKE-6	IV (-8)_4	19.00	19.80	3.300	742.0	46.00	46.00	1.82	8.900	7.920	0.540	tr	0.014	0.116
313	MJBKE-6	IV (-8)_5	19.80	21.00	2.300	235.0	29.62	31.50	0.17	0.550	12.360		-	0.220	0.860
314	MJBKE-6	IV (-8)_6	21.00	22.00	2.400	250.0	31.10	31.10	0.08	0.260	3.060	0.130		0.130	0.440
315	MJBKE-7	II-36-1	30.50	31.50	4.100	170.0	42.35	42.35	0.43	0.420	29.560	0.800	-	0.330	0.700
316	MJBKE-7	II-36-2	31.50	32.50	4.100	267.0	33.50	33.50	0.35	0.680	50.910	1.110	-	0.110	2.380
317	MJBKE-7	II-36-3	32.50	33.50	4.300	255.0	31.70	31.70	0.22	0.410	93.780	1.700	tr	0.070	2.650
318	MJBKE-7	II-36-4	33.50	34.20	2.800	145.0	36.40	36.40	0.42	0.600	0.600	0.020	-	tr	0.120
319	MJBKE-7	II-36-5	34.20	35.00	3.100	205.0	38.40	38.40	0.11	0.190	0.110	tr	-	tr	-
320	MJBKE-7	II-36-6	35.00	36.00	4.100	275.0	34.20	34.20	0.07	0.140	1.191	0.024	-	tr	0.015



**Appendix 2-10 Quantity Mineralgical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after vining (-1.0 m) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
321	MJBKE-7	II-36-7	36.00	37.00	4.200	370.0	34.82	34.82	0.05	0.130	0.541	0.017	-	0.003	0.011
322	MJBKE-8	II 32 1	47.00	48.00	7.900	125.0	32.10	31.20	0.25	0.130	2.232	0.034	tr	0.007	0.034
323	MJBKE-8	II 32 2	48.00	49.00	7.500	200.0	25.19	25.19	0.36	0.380	2.909	0.067	tr	0.003	0.015
324	MJBKE-8	II 32 3	49.00	50.00	6.700	190.0	35.10	35.10	0.29	0.230	0.213	0.005	tr	tr	0.008
325	MJBKE-8	II 32 4	50.00	51.00	6.900	115.0	28.50	28.50	0.15	0.090	0.080	0.002	-	tr	0.013
326	MJBKE-9	II 28 1	44.30	45.30	3.800	121.0	30.20	30.20	0.23	0.240	0.182	0.036	-	tr	0.073
327	MJBKE-9	II 28 2	45.30	46.30	3.500	55.0	27.50	27.50	2.55	1.460	0.038	tr	-	tr	0.019
328	MJBKE-9	II 28 3	46.30	47.30	3.400	475.0	29.40	29.40	0.52	2.470	0.097	tr	-	tr	0.024
329	MJBKE-9	II 28 4	47.30	48.30	3.600	135.0	33.90	33.90	0.35	0.390	0.056	0.003	-	tr	0.010
330	MJBKE-10	II-12-1	17.00	18.00	3.250	39.0	38.17	38.17	0.81	0.250	5.937	0.162	-	0.014	0.077
331	MJBKE-10	II-12-2	18.00	18.90	1.550	24.5	24.50	24.50	0.24	0.150	8.461	0.191	-	0.008	0.276
332	MJBKE-10	II-12-3	18.90	20.50	5.550	140.0	35.00	35.00	0.05	0.040	2.151	0.059	-	0.003	0.055
333	MJBKE-10	II-12-4	20.50	22.00	4.500	58.0	30.00	30.00	1.77	0.760	1.984	0.081	-	0.003	0.044
334	MJBKE-11	II-8-1	5.00	6.00	3.300	94.0	47.00	47.00	0.44	0.270	18.630	0.483	-	0.034	0.449
335	MJBKE-11	II-8-2	6.00	7.30	2.000	32.8	32.75	32.75	0.44	0.220	104.490	2.365	-	0.074	0.664
336	MJBKE-11	II-8-3	7.30	8.80	2.100	207.0	37.20	37.20	0.06	0.160	119.317	2.849	tr	0.059	0.772
337	MJBKE-11	II-8-4	8.80	10.00	3.900	575.0	35.70	35.70	0.06	0.250	90.028	1.867	-	tr	0.934
338	MJBKE-12	XI 6 4	11.50	13.00	4.900	650.0	40.10	40.10	0.09	0.300	87.720	1.514	-	tr	0.712
339	MJBKE-12	XI 6 5	13.00	14.00	4.400	620.0	38.00	38.00	0.05	0.190	5.732	0.134	-	tr	0.134
340	MJBKE-12	XI 6 6	14.00	15.00	2.600	380.0	35.50	35.50	0.08	0.330	2.469	0.057	-	0.004	0.052
341	MJBKE-12	XI 6 7	15.00	16.00	4.100	835.0	26.10	26.10	0.01	0.080	0.502	0.008	-	0.025	0.051
342	MJBKE-13	III-36-1	33.80	35.00	3.900	148.0	37.00	37.00	0.91	0.930	0.874	0.032	-	0.004	0.069
343	MJBKE-13	III-36-2	35.00	36.00	3.900	260.0	32.30	32.30	0.82	1.690	0.357	0.014	tr	0.001	0.012
344	MJBKE-13	III-36-3	36.00	37.00	4.100	125.0	31.30	31.30	0.62	0.600	11.332	0.324	tr	0.024	0.155
345	MJBKE-13	III-36-4	37.00	38.20	5.700	543.0	34.00	34.00	0.34	0.954	0.518	0.009	tr	0.001	0.008
346	MJBKE-13	III-36-5	38.20	39.20	3.600	580.0	36.00	36.00	0.67	2.978	1.369	0.010	tr	0.003	0.056
347	MJBKE-13	III-36-6	39.20	40.50	4.200	217.0	27.40	27.40	0.13	0.248	4.786	0.109	-	0.010	0.089
348	MJBKE-13	III-36-7	40.50	42.00	4.900	395.0	36.80	36.80	0.04	0.090	0.072	0.007	-	tr	0.022
349	MJBKE-14	III 32 3	43.00	44.00	4.700	360.0	44.00	44.00	0.56	0.970	0.354	0.005	-	tr	0.005
350	MJBKE-14	III 32 4	44.00	45.00	3.800	330.0	41.50	41.50	0.42	0.880	0.832	0.025	-	0.005	0.020
351	MJBKE-14	III 32 5	45.00	45.60	2.500	245.0	30.50	30.50	0.36	1.160	0.756	0.023	tr	0.002	0.009
352	MJBKE-14	III 32 6	45.60	46.60	3.200	206.0	26.50	26.50	0.20	0.490	0.276	0.012	tr	0.002	0.008
353	MJBKE-14	III 32 7	46.60	48.00	4.400	250.0	31.30	31.30	0.32	0.580	27.996	1.092	tr	0.019	0.686
354	MJBKE-15	III 28 1	38.00	39.00	7.500	185.0	45.20	46.00	9.15	4.910	2.972	0.083	-	0.011	0.028
355	MJBKE-15	III 28 2	39.00	40.00	7.200	145.0	36.85	36.85	0.94	0.510	0.423	0.023	tr	0.003	0.007
356	MJBKE-15	III 28 3	40.00	41.00	6.900	500.0	31.75	26.80	0.05	0.140	0.782	0.040	-	tr	0.022
357	MJBKE-15	III 28 4	41.00	42.00	6.500	685.0	42.57	42.57	0.27	0.690	12.047	0.247	-	tr	0.365
358	MJBKE-16	IX 3 1	22.00	23.00	4.600	98.0	36.80	36.80	1.98	1.150	100.000	2.286	tr	0.114	1.028
359	MJBKE-16	IX 3 2	23.00	24.00	3.700	165.0	41.57	41.57	2.37	2.540	0.291	0.009	-	tr	0.019
360	MJBKE-16	IX-3-3	24.00	25.50	6.700	1216.0	38.30	38.30	3.02	14.310	0.288	0.012	-	tr	0.025



**Appendix 2-10 Quantity Mineralgical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after vining (-1.0 m) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
361	MJBKE-16	IX-3-4	25.50	26.70	6.800	1261.0	40.05	40.05	3.81	17.640	0.690	0.020	tr	-	0.010
362	MJBKE-16	IX-3-5	26.70	27.80	5.000	763.0	35.50	35.50	3.49	15.000	0.073	0.003	-	tr	3.644
363	MJBKE-16	IX_3_6	27.80	29.00	4.600	500.0	31.25	31.25	1.88	6.540	2.940	0.140	-	-	0.050
364	MJBKE-17	IX_2_1	19.00	20.00	4.100	35.9	35.94	35.94	1.73	0.420	8.860	0.340	-	tr	0.610
365	MJBKE-17	IX_2_2	20.00	21.00	3.500	16.0	16.00	16.00	0.84	0.240	5.060	0.140	-	-	0.240
366	MJBKE-17	IX_2_3	21.00	22.00	3.200	85.0	42.20	43.90	0.34	0.210	0.470	0.020	-	-	0.048
367	MJBKE-17	IX_2_4	22.00	23.00	3.600	385.0	36.40	38.40	0.04	0.110	0.070	tr	-	tr	0.040
368	MJBKE-18	IX_0_1	6.50	7.50	3.700	360.0	45.00	45.00	0.39	0.840	1.150	0.070	-	-	0.110
369	MJBKE-18	IX_0_2	7.50	8.50	3.500	197.0	37.15	37.15	0.24	0.360	1.080	0.020	-	-	0.070
370	MJBKE-18	IX_0_3	8.50	9.50	3.800	122.0	31.25	31.25	0.07	0.070	2.040	0.060	tr	0.010	0.080
371	MJBKE-18	IX_0_4	9.50	10.50	3.700	118.0	29.70	30.70	0.08	0.080	0.080	0.010	-	-	0.055
372	MJBKE-19	IV_(-12)_1	13.00	14.00	3.900	115.0	35.00	35.00	0.45	0.460	0.120	0.010	-	-	0.077
373	MJBKE-19	IV_(-12)_2	14.00	14.80	3.500	343.0	40.00	40.00	0.47	0.270	0.400	tr	-	-	0.200
374	MJBKE-19	IV_(-12)_3	14.80	16.00	4.000	505.0	34.10	34.10	0.10	0.100	0.500	0.010	-	-	0.310
375	MJBKE-19	IV_(-12)_4	16.00	17.00	3.700	140.0	37.70	37.70	0.07	0.070	3.380	0.060	-	-	0.640
376	MJBKE-20	IV_8_1	4.50	6.00	2.600	295.0	36.30	37.60	0.18	0.540	0.480	0.020	-	-	0.330
377	MJBKE-21	IV_4_1	13.00	14.00	3.400	21.2	21.22	21.22	0.92	0.270	0.030	tr	-	-	0.008
378	MJBKE-21	IV_4_2	14.00	15.00	3.600	15.5	15.47	15.47	0.38	0.110	0.050	tr	-	-	0.036
379	MJBKE-21	IV_4_3	15.00	16.00	3.300	11.8	11.77	11.77	0.23	0.070	0.010	tr	-	-	0.010
380	MJBKE-21	IV_4_4	16.00	17.00	3.300	134.0	33.90	33.90	0.19	0.230	0.024	tr	-	-	0.022
381	MJBKE-21	IV_4_5	17.00	18.00	3.900	479.0	29.75	29.75	0.04	0.160	0.064	0.025	-	-	0.098
382	MJBKE-22	V_12_1	6.00	7.00	2.200	80.0	40.00	40.00	2.22	2.020	0.128	0.011	-	-	0.191
383	MJBKE-22	V_12_2	7.00	7.80	2.600	90.0	45.00	45.00	1.85	1.420	0.110	0.016	-	-	0.034
384	MJBKE-23	V_4_1	4.00	5.00	2.200	435.0	27.95	27.95	0.83	5.870	0.055	tr	-	-	0.092
385	MJBKE-23	V_4_2	5.00	6.00	1.500	174.0	43.50	43.50	1.06	2.830	0.082	tr	-	-	0.120
386	MJBKE-24	V_8_1	5.00	6.00	2.400	265.0	33.20	33.20	0.88	2.930	0.422	0.011	-	-	0.095
387	MJBKE-24	V_8_2	6.00	7.00	2.500	155.0	38.90	38.90	2.48	3.950	0.118	tr	-	-	0.040
388	MJBKE-25	IV_(-16)_1	19.00	20.00	3.500	25.1	25.09	25.09	1.06	0.300	0.008	0.002	-	-	0.020
389	MJBKE-25	IV_(-16)_2	20.00	21.00	4.000	112.0	28.00	28.00	1.47	1.470	0.065	tr	-	-	0.155
390	MJBKE-25	IV_(-16)_3	21.00	22.00	4.700	480.0	30.00	30.00	1.62	5.510	0.025	0.015	tr	tr	0.009
391	MJBKE-25	IV_(-16)_4	22.00	23.20	5.300	1345.0	42.10	42.10	2.30	13.860	0.164	tr	-	-	-
392	MJBKE-25	IV_(-16)_5	23.20	24.50	5.800	1845.0	28.70	28.70	1.47	16.290	0.039	0.020	-	-	0.189
393	MJBKE-25	IV_(-16)_6	24.50	25.50	4.300	1537.0	36.20	36.20	2.28	22.510	0.062	tr	-	-	0.266
394	MJBKE-25	IV_(-16)_7	25.50	26.50	3.900	1316.0	41.10	41.10	2.36	19.380	0.068	0.042	-	-	0.305
395	MJBKE-25	IV_(-16)_8	26.50	27.50	3.000	525.0	32.07	32.07	0.06	0.330	0.009	0.048	-	-	0.243
396	MJBKE-25	IV_(-16)_9	27.50	28.50	2.900	720.0	45.00	45.00	0.62	3.420	0.040	tr	-	-	0.080
397	MJBKE-26	IV_(-20)_1	19.00	20.00	3.500	34.6	34.62	34.62	2.73	0.780	0.010	0.020	-	-	0.120
398	MJBKE-26	IV_(-20)_2	20.00	21.00	3.200	39.7	39.65	39.65	2.45	0.760	0.038	0.045	-	-	0.025
399	MJBKE-26	IV_(-20)_3	21.00	22.00	2.200	95.0	35.50	36.80	0.12	0.140	0.315	0.021	-	-	0.064
400	MJBKE-26	IV_(-20)_4	22.00	23.00	3.000	446.0	27.80	28.80	0.01	0.050	1.108	0.092	-	-	0.064



**Appendix 2-10 Quantity Mineralgical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after drying (-1.0 mm) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucosene (kg/t)	the others (kg/t)
401	MJBKE-27	X 4 1	3.70	4.70	3.100	169.0	42.32	42.32	0.76	0.980	0.200	tr	-	0.013	0.014
402	MJBKE-27	X 4 2	4.70	5.50	2.500	450.0	28.29	28.29	0.13	0.830	0.937	0.027	tr	tr	0.023
403	MJBKE-28	XI 5 1	10.20	11.00	2.400	115.0	28.70	28.70	0.23	0.380	1.600	0.063	-	0.003	0.031
404	MJBKE-28	XI 5 2	11.00	12.00	3.300	343.00	42.50	42.50	0.07	0.170	0.197	0.008	tr	tr	0.012
405	MJBKE-28	XI 5 3	12.00	13.00	3.400	505.00	31.60	31.60	0.03	0.140	0.529	0.013	-	-	2.332
406	MJBKE-29	XI-4-1	10.80	12.00	5.300	790.00	36.70	36.70	1.81	7.350	0.667	0.028	-	-	0.810
407	MJBKE-29	XI-4-2	12.00	13.00	4.600	675.00	42.20	42.20	2.64	9.180	1.750	0.080	-	0.040	0.200
408	MJBKE-29	XI-4-3	13.00	14.00	4.900	2055.00	32.10	32.10	1.56	20.380	1.800	0.020	-	0.050	0.240
409	MJBKE-29	XI 4 4	14.00	15.00	3.700	845.00	26.60	26.60	0.16	1.370	0.430	0.040	-	0.070	0.140
410	MJBKE-29	XI 4 5	15.00	16.00	4.300	640.00	40.00	40.00	0.06	0.220	0.360	0.010	-	0.050	0.050
411	MJBKE-30	XI 3 1	9.50	10.80	4.400	460.00	28.74	28.74	1.87	6.800	0.210	0.010	-	0.070	0.170
412	MJBKE-30	XI 3 2	10.80	12.00	4.100	325.00	40.20	40.20	2.63	5.190	0.193	0.024	-	tr	0.024
413	MJBKE-30	XI 3 3	12.00	13.00	3.100	140.00	35.00	36.00	0.09	0.110	2.136	0.089	tr	0.018	0.071
414	MJBKE-31	XI 2 1	11.00	12.00	3.600	46.50	46.47	46.47	3.50	0.970	14.467	0.542	tr	0.145	0.470
415	MJBKE-31	XI 2 2	12.00	13.40	5.400	170.00	42.52	42.52	0.18	0.130	8.000	0.514	tr	0.114	0.286
416	MJBKE-31	XI 2 3	13.40	14.40	3.300	200.00	25.00	25.00	0.03	0.070	9.793	0.515	tr	0.172	0.687
417	MJBKE-31	XI 2 4	14.40	15.40	3.600	145.00	36.20	36.20	0.47	0.520	15.855	0.661	tr	0.330	0.826
418	MJBKE-32	XI 1 1	8.10	9.00	2.700	28.60	28.60	28.60	1.07	0.400	14.190	0.495	-	0.165	0.660
419	MJBKE-32	XI 1 2	9.00	10.00	3.500	125.00	31.20	31.20	0.04	0.050	4.725	0.270	tr	0.135	0.405
420	MJBKE-35	XI-6-2	10.10	10.80	3.400	366.00	45.50	45.50	2.64	4.530	8.949	0.681	-	0.292	1.167
421	MJBKE-35	XI-6-3	10.80	11.50	3.100	730.00	44.55	44.55	2.72	14.380	11.867	0.533	-	0.067	1.933
422	MJBKE-34	VII 36 1	29.00	30.00	3.300	150.00	37.70	37.70	0.44	0.530	4.463	0.421	-	0.042	1.011
423	MJBKE-34	VII 36 2	30.00	30.50	2.300	235.00	29.55	29.55	0.84	2.900	0.233	0.025	-	tr	0.042
424	MJBKE-34	VII 36 3	30.50	31.50	3.700	260.0	32.70	33.50	0.05	0.100	0.250	0.050	-	tr	0.150
425	MJBKE-34	VII 36 4	31.50	32.50	3.600	405.0	37.70	38.30	0.02	0.060	1.661	0.356	tr	0.059	0.178
426	MJBKE-33	XI 7 1	8.40	9.30	3.800	465.0	29.00	29.00	1.60	6.750	0.781	0.156	-	0.052	0.157
427	MJBKE-33	XI-7-2	9.30	10.00	2.800	1160.0	36.10	36.10	1.89	21.690	0.715	0.190	-	0.048	0.095
428	MJBKE-33	XI-7-3	10.00	11.00	4.100	1410.0	44.00	44.00	2.52	19.700	1.454	0.025	-	0.097	0.146
429	MJBKE-33	XI-7-4	11.00	11.40	1.600	265.0	33.10	33.10	1.97	9.860	1.261	0.339	-	0.097	0.145
430	MJBKE-33	XI-7-5	11.40	12.60	4.600	1096.0	34.20	34.20	1.45	10.100	1.898	0.178	-	0.059	0.237
431	MJBKE-33	XI-7-6	12.60	13.70	4.500	1380.0	42.17	42.17	5.01	36.430	1.975	0.274	-	0.110	0.165
432	MJBKE-33	XI 7 7	13.70	15.00	4.600	225.0	28.37	28.37	2.48	4.280	0.274	0.063	-	0.025	0.101
433	MJBKE-33	XI 7 8	15.00	16.00	3.800	100.0	25.10	25.10	0.05	0.050	2.298	0.398	tr	0.194	1.001
434	MJBKE-36	X 3 1	15.00	16.00	3.200	110.0	27.50	27.50	1.23	1.540	7.847	0.317	tr	0.119	0.277
435	MJBKE-36	X 3 2	16.00	17.00	4.100	220.0	27.50	27.50	3.59	7.000	0.257	tr	-	tr	0.043
436	MJBKE-36	X 3 3	17.00	17.80	3.000	795.0	37.75	37.75	2.77	19.440	0.427	0.040	-	tr	0.040
437	MJBKE-36	X 3 4	17.80	19.00	3.500	275.0	34.80	34.80	0.06	0.130	0.123	0.010	-	tr	0.031
438	MJBKE-36	X 3 5	19.00	20.00	3.600	520.0	32.50	33.50	0.05	0.220	3.900	0.126	tr	0.063	0.189
439	MJBKE-37	X 2 1	15.00	16.00	3.200	20.5	20.17	20.17	2.25	0.700	0.061	0.008	-	0.008	0.015
440	MJBKE-37	X 2 2	16.00	17.00	3.200	55.0	27.50	27.50	1.41	0.880	3.840	0.256	-	0.064	0.192



**Appendix 2-10 Quantity Mineralgical Analysis of Usual and Check Samples**

No.	No. of drillholes	Sample No.	Depth (m)		Weight of dried sample (kg)	Weight of sand after siving (-1.0 mm) (g)	Weight of sample for analysis (g)	Weight of sample for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Content of heavy fractions				
											Ilmenite (kg/t)	Zircon (kg/t)	Rutile (kg/t)	Leucoxene (kg/t)	the others (kg/t)
441	MJBKE-37	X 2 3	17.00	18.00	2.700	178.0	44.20	44.20	0.11	0.160	7.168	0.448	tr	0.256	0.832
442	MJBKE-37	X 2 4	18.00	19.00	2.900	555.0	34.80	35.80	0.03	0.160	7.973	0.221	tr	0.148	0.517
443	MJBKE-38	XII 3 1	14.00	15.00	3.400	185.0	34.50	34.50	0.11	0.170	6.545	0.218	tr	0.291	0.510
444	MJBKE-38	XII 3 2	15.00	16.00	3.500	295.0	36.72	36.72	0.06	0.140	0.427	0.040	-	tr	0.040
445	MJBKE-39	XII 1 1	13.20	14.00	3.000	1105.0	34.50	34.50	2.36	25.200	0.123	0.010	-	tr	0.031
446	MJBKE-39	XII 1 2	14.00	14.80	3.100	740.0	46.20	46.20	2.81	14.520	3.900	0.126	tr	0.063	0.189
447	MJBKE-40	XII 2 1	11.00	12.00	3.200	130.0	32.50	32.50	1.37	1.710	0.061	0.008	-	0.008	0.015
448	MJBKE-40	XII 2 2	12.00	12.80	2.800	225.0	28.72	28.72	1.38	3.860	3.840	0.256	-	0.064	0.192
449	MJBKE-40	XII 2 3	12.80	13.80	4.600	1380.0	42.38	42.38	2.87	20.320	7.168	0.448	tr	0.256	0.832
450	MJBKE-40	XII 2 4	13.80	14.50	1.400	135.0	33.70	33.70	1.02	2.920	7.973	0.221	tr	0.148	0.517
451	MJBKE-41	XII 4 1	13.00	14.00	2.200	255.00	31.35	31.35	10.59	39.150	6.545	0.218	tr	0.291	0.510
452	MJBKE-41	XII 4 2	14.00	15.00	2.200	223.00	27.80	27.80	9.14	33.330	0.067	0.015	tr	0.007	0.044



**Appendix 2-11 Inside Geological Check of  
Mineralogical Analysis**



**Appendix 2-11 Inside Geological Check of Mineralogical Analysis (I)**

No.	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite		Zircon	
								Classes of content	Content (kg/t)	Classes of content	Content (kg/t)
1		4.9	2266	32.50	32.50	3.54	50.890	II	48.730	II	1.650
2		4.4	1925	42.50	42.50	4.41	45.400	II	43.240	I	1.540
3		2.9	1035	27.70	27.60	4.77	61.680	III	58.580	II	2.200
4		3.5	1855	35.90	35.90	5.18	76.470	III	73.370	II	2.070
5		2.5	1435	28.90	28.90	6.05	120.160	III*	114.400	III	4.170
6		5.5	969	40.50	40.50	6.32	27.490	I	26.190	I	0.740
7		2.0	560	46.70	46.70	8.44	50.600	II	48.330	I	0.960
8		1.7	509	36.00	36.00	11.47	95.400	III	91.320	II	1.410
9		1.4	415	44.40	44.40	1.37	9.150	I	8.410	I	0.270
10		2.5	630	36.30	36.30	1.62	11.250	I	10.470	I	0.280
11		3.3	620	30.20	30.20	6.21	38.630	I	37.200	I	0.840
12		3.2	235	49.70	49.70	9.03	13.340	I	12.070	I	0.400
13		2.3	603	32.50	32.50	2.80	22.590	I	21.380	I	0.770
14		2.7	415	47.90	47.90	3.97	12.740	I	12.190	I	0.350
15		5.0	645	37.80	37.80	4.91	16.760	I	15.940	I	0.510
16		3.5	2175	33.00	33.00	8.16	155.890	III*	149.970	II	3.630
17		3.6	2085	40.50	40.50	7.75	112.390	III*	108.180	II	2.610
18		5.2	783	34.40	34.40	3.27	14.310	I	13.480	I	0.610
19		7.0	1892	44.10	44.10	6.43	39.140	I	37.510	I	1.350
20		4.0	1995	41.00	41.00	8.34	101.450	III	98.050	II	2.680
21		4.3	1737	39.10	39.10	10.74	108.170	III	107.030	II	2.070
22		4.2	747	41.20	41.20	4.00	17.270	I	16.100	I	0.840
23		0.8	228	39.80	39.80	5.65	40.460	II	38.810	I	1.150
24		5.2	1071	27.30	27.30	3.95	30.090	I	28.410	I	0.920
25		2.15	810	36.50	36.50	7.54	77.830	III	74.210	I	1.750
26		4.1	650	34.30	34.30	6.27	28.980	I	27.220	I	0.740
27		2.9	179	30.50	30.50	5.17	10.460	I	9.570	I	0.360
28		4.2	352	36.50	36.50	4.67	10.720	I	9.830	I	0.440
29		12.9	1962	35.30	35.30	3.47	14.950	I	14.040	I	0.470
30		11.3	2115	44.20	44.20	4.57	19.350	I	18.340	I	0.510
31		8.8	3235	32.80	32.80	4.34	46.640	II	44.050	I	1.120
32		12.8	3530	42.40	42.40	11.96	77.390	III	74.670	I	1.630
33		14.6	2965	33.90	33.90	2.34	14.020	I	12.760	I	0.540
34		11.9	2496	39.90	39.90	2.45	12.880	I	11.620	I	0.530
35		10.1	2165	28.60	28.60	2.54	19.040	I	17.470	I	0.750
36		6.3	1475	32.60	32.60	3.55	25.500	I	23.410	I	1.290
37		11.4	4455	30.70	30.70	1.75	22.330	I	20.160	I	0.570
38		9.4	4720	36.00	36.00	3.39	47.280	II	45.470	I	0.910
39		6.2	2965	49.90	49.90	12.85	123.150	III*	118.450	II	2.160
40		10.5	6413	28.70	28.70	7.43	158.120	III*	151.730	II	2.020
41		9.4	3673	49.20	49.20	8.72	69.250	III	66.550	I	1.030
42		7.9	2900	36.60	36.60	2.91	29.190	I	27.580	I	0.700
43		7.7	3020	34.70	34.70	3.57	40.350	II	38.540	I	0.900
44		9.7	4745	28.40	28.40	1.53	26.350	I	24.800	I	0.450
45		6.2	2675	29.60	29.60	2.06	30.030	I	28.420	I	0.790
46		7.7	4855	30.10	30.10	2.22	46.810	II	43.640	I	1.370
47		9.7	3910	24.00	24.00	1.88	31.740	I	29.880	I	0.760
48		8.5	3600	35.70	35.70	3.75	44.490	II	42.120	I	0.830
49		10.5	4705	31.70	31.70	2.85	40.290	I	37.460	I	0.850
50		5.1	2540	43.20	43.20	6.11	71.140	III	67.530	I	1.220
51		6.4	910	39.20	39.20	4.00	14.510	I	13.670	I	0.290
52		7.5	2440	36.60	36.60	4.36	38.760	I	36.710	I	0.710
53		7.9	3405	34.30	34.30	2.70	33.930	I	32.290	I	0.750
54		11.1	5845	29.90	29.90	4.79	84.360	III	79.600	I	1.230
55		11.7	6035	30.50	30.50	5.63	95.200	III	90.980	I	1.610
56		15.8	7910	42.10	42.10	7.31	87.200	III	83.270	I	1.370
57		9.1	4530	28.50	28.50	4.15	72.490	III	68.990	I	1.310
58		6.4	2185	28.30	28.30	5.41	65.780	III	62.980	I	1.160
59		4.5	1480	27.80	27.80	5.22	61.760	III	58.560	I	1.180
60		11.6	1474	27.70	27.70	2.68	12.290	I	11.470	I	0.230



**Appendix 2-11 Inside Geological Check of Mineralogical Analysis (1)**

No.	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite		Zircon	
								Classes of content	Content (kg/t)	Classes of content	Content (kg/t)
61		6.4	1725	35.00	35.00	6.72	51.750	II	49.820	I	0.770
62		6.2	2220	29.30	29.30	6.80	83.100	III	79.190	I	1.340
63		12.7	2790	43.00	43.00	4.43	22.630	I	21.660	I	0.480
64		8.2	2215	27.90	27.90	3.88	37.790	I	35.750	I	0.780
65		7.6	1015	24.80	24.80	5.44	29.300	I	26.820	I	0.430
66		16.5	5657	39.00	39.00	9.92	87.210	III	83.510	II	2.020
67		9.5	3450	34.50	34.50	6.68	70.320	III	67.370	II	1.790
68		3.4	373	36.70	36.70	6.16	18.410	I	17.520	I	0.630
69		7.2	1635	33.40	33.40	13.29	90.360	III	87.160	I	1.770
70		6.6	1950	45.10	45.10	6.23	40.810	II	39.310	I	0.790
71		8.5	1470	28.70	28.70	5.80	34.950	I	33.440	I	0.540
72		11.3	785	35.40	35.40	7.76	15.230	I	14.620	I	0.260
73		9.5	880	36.10	36.10	6.49	16.650	I	15.370	I	0.590
74		8.5	1027	44.00	44.00	7.34	20.160	I	18.840	I	0.550
75		7.5	585	27.20	27.20	4.75	13.620	I	12.700	I	0.340
76		11.7	785	27.50	27.50	4.45	10.860	I	10.200	I	0.240
77		6.1	1713	35.80	35.80	6.44	50.520	II	47.380	I	1.100
78		7.9	2130	31.90	31.90	5.89	49.780	II	47.670	I	1.060
79		5.1	585	44.20	44.20	12.98	33.680	I	32.540	I	0.620
80		9.9	1605	36.60	36.60	9.10	40.310	II	38.710	I	0.660
81		9.1	2320	35.20	35.20	8.33	60.330	III	57.650	I	1.090
82		11.7	2156	27.40	27.40	3.41	22.930	I	21.860	I	0.540
83		16.8	9800	39.60	39.60	4.57	67.320	III	63.050	I	1.330
84		13.7	7665	38.80	38.80	4.63	66.760	III	63.880	I	1.150
85		7.4	2310	42.90	42.90	7.70	56.030	III	51.950	II	1.460
86		5.3	1575	30.40	30.40	9.07	88.660	III	84.260	II	2.050
87		11.0	2110	42.00	42.00	12.76	58.280	III	55.670	I	1.140
88		9.3	2000	38.50	38.50	11.49	64.180	III	61.560	I	1.170
89		7.9	1870	38.60	38.60	10.98	67.330	III	64.020	I	1.470
90		6.1	1675	30.30	30.30	15.29	138.560	III*	133.130	II	2.450

Classes of content:

Ilmenite: I 8.33-38.88 kg/t II 38,89-55.56 kg/t III > 55.56 kg/t

Zircon: I 0.16-1.57 kg/t II 1.58-3.15 kg/t III > 3.15 kg/t



**Appendix 2-12 Outside Geological Check of  
Mineralogical Analysis**



Appendix 2-12 Outside Geological Check of Mineralogical Analysis

No.	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite			Zircon		
								Classes of content		Content (kg/t)	Classes of content		Content (kg/t)
								Basic	Checking	Checking	Basic	Checking	Checking
1	343	4.9	2266	36.5	36.20	4.57	58.98	II	II	52.66	II	II	1.98
2	344	4.4	1925	45.9	45.60	4.79	45.96	II	II	42.01	I	II	1.71
	344	4.4	1925	45.9	45.60	4.79	45.96	II	II	40.74	I	II	1.60
3	345	2.9	1035	34.1	34.40	5.85	60.69	III	II	53.46	II	II	2.11
	345	2.9	1035	34.1	34.40	5.85	60.69	III	II	53.42	II	II	2.28
4	346	3.5	1855	39.0	39.60	5.77	77.22	III	III	70.57	II	II	2.40
5	347	2.5	1435	33.7	33.30	7.10	122.38	III*	III*	111.37	I	I	3.24
6	348	5.5	969	41.7	41.40	7.33	31.19	I	I	25.25	I	I	0.51
7	349	2.0	560	41.5	41.10	7.93	54.02	II	II	47.58	I	I	0.90
8	350	1.7	509	41.5	41.20	14.46	105.08	III	III	91.68	II	II	1.87
9	351	1.4	415	45.9	45.60	1.58	10.27	I	I	9.02	I	I	0.39
10	352	2.5	630	37.4	36.90	1.78	12.16	I	I	10.15	I	I	0.42
11	353	3.3	620	34.4	33.90	8.61	47.72	I	I	35.69	I	I	1.07
12	354	3.2	235	54.8	54.40	23.08	31.15	I	I	11.26	I	I	0.47
13	355	2.3	603	35.9	35.60	3.76	27.69	I	I	25.69	I	I	1.10
14	356	2.7	415	50.9	50.60	5.03	15.28	I	I	13.81	I	I	0.72
15	357	5.0	645	42.2	42.00	7.12	21.87	I	I	16.31	I	I	0.65
16	358	3.5	2175	33.0	32.60	8.29	160.20	III*	III*	153.11	II	III	3.89
	358	3.5	2175	33.0	32.60	8.29	160.20	III*	III*	154.12	II	III	3.62
17	359	3.6	2085	43.8	43.50	8.95	120.84	III*	III*	114.21	II	II	3.15
18	360	5.2	783	33.2	32.80	3.45	15.84	I	I	13.98	I	I	0.60
19	361	7.0	1892	39.8	39.30	6.29	43.26	I	I	37.19	I	I	1.22
20	362	4.0	1995	43.7	43.50	9.35	107.20	III	III	98.02	II	II	2.66
21	363	4.3	1737	39.3	38.80	10.91	113.59	III	III	104.89	II	II	2.23
22	364	4.2	747	43.0	42.50	5.34	22.35	I	I	18.54	I	I	0.88
23	365	0.8	228	44.4	43.90	6.51	42.26	II	II	39.72	I	I	1.31
24	366	5.2	1071	29.4	29.10	5.64	40.31	I	I	31.18	I	I	0.91
25	367	2.2	810	39.4	39.20	7.91	76.02	III	III	70.68	I	II	1.85
	367	2.2	810	39.4	39.20	7.91	76.02	III	III	69.47	I	II	1.92
26	368	4.1	650	35.8	35.50	7.05	31.48	I	I	27.11	I	I	0.54
27	369	2.9	179	33.0	32.70	6.30	11.89	I	I	9.14	I	I	0.35
28	370	4.2	352	40.5	40.20	8.30	17.30	I	I	9.35	I	I	0.37
29	371	12.9	1962	38.1	37.90	4.55	18.26	I	I	15.45	I	I	0.44
30	372	11.3	2115	45.8	45.60	6.36	26.11	I	I	18.68	I	I	0.46
31	373	8.8	3235	33.8	33.40	4.62	50.85	II	II	47.60	I	I	1.11
32	374	12.8	3530	43.0	42.60	11.84	76.65	III	III	72.79	I	I	1.31
33	375	14.6	2965	36.1	35.60	5.83	33.26	I	I	12.32	I	I	0.51
34	376	11.9	2496	43.0	42.80	9.05	44.35	I	I	11.63	I	I	0.47
35	377	10.1	2165	33.5	33.30	7.75	49.89	I	I	16.06	I	I	0.65
36	378	6.3	1475	39.9	39.50	8.49	50.32	I	I	22.13	I	I	0.98
37	379	11.4	4455	35.0	34.80	2.06	23.13	I	I	19.87	I	I	0.54
38	380	9.4	4720	41.1	40.70	4.20	51.82	II	II	48.85	I	I	1.11
39	381	6.2	2965	54.8	54.60	14.87	130.24	III*	III*	122.90	II	II	1.99
40	382	10.5	6413	34.1	33.80	9.12	164.80	III*	III*	156.43	II	II	2.13
41	383	9.4	3673	55.7	55.40	10.77	75.96	III	III	71.66	I	I	1.39
42	384	7.9	2900	34.7	34.30	4.49	48.05	I	I	26.08	I	I	0.70
43	385	7.7	3020	30.2	30.00	5.19	67.85	II	II	40.39	I	I	0.94
44	386	9.7	4745	35.4	35.00	2.46	34.38	I	I	26.26	I	I	0.61
45	387	6.2	2675	32.5	32.20	2.67	35.76	I	I	30.63	I	I	0.70
46	388	7.7	4855	34.8	34.40	2.66	49.07	II	II	45.70	I	I	0.97
47	389	9.7	3910	26.9	26.50	2.47	37.76	I	I	34.52	I	I	0.87
48	390	8.5	3600	37.6	36.40	6.01	69.93	II	II	46.64	I	I	1.01
49	391	10.5	4705	40.3	40.10	4.19	46.82	I	I	36.39	I	I	0.71
	391	10.5	4705	40.3	40.10	4.19	46.82	I	I	36.39	I	I	0.71
50	392	5.1	2540	47.8	47.40	7.33	77.78	III	III	74.96	I	I	1.14
51	393	6.4	910	41.1	40.90	4.60	15.99	I	I	14.45	I	I	0.28
52	394	7.5	2440	36.0	35.60	4.50	41.12	I	I	38.88	I	I	0.70
53	395	7.9	3405	37.8	37.50	3.38	38.85	I	I	35.26	I	I	0.68



Appendix 2-12 Outside Geological Check of Mineralogical Analysis

No.	Sample No.	Primary weight of dry sample (kg)	Weight of black sand after sieving (g)	Weight of specimen for mineralogical analysis (g)	Specimen for separation (g)	Weight of heavy fraction (g)	Content of heavy fraction (kg/t)	Ilmenite			Zircon		
								Classes of content		Content (kg/t)	Classes of content		Content (kg/t)
								Basic	Checking	Checking	Basic	Checking	Checking
54	396	11.1	5845	32.5	32.10	5.39	88.42	III	III	82.90	I	I	1.17
55	397	11.7	6035	36.8	36.30	7.41	105.29	III	III	99.69	I	I	1.36
56	398	15.8	7910	47.4	47.10	9.18	97.88	III	III	88.99	I	I	1.57
57	399	9.1	4530	30.8	30.50	4.91	80.14	III	III	70.93	I	I	1.27
58	400	6.4	2185	30.7	30.40	5.91	66.89	III	III	63.88	I	I	1.37
59	401	4.5	1480	29.9	29.50	5.82	64.88	III	III	61.88	I	I	1.27
60	402	11.6	1474	31.5	31.10	3.60	14.71	I	I	13.34	I	I	0.29
61	403	6.4	1725	44.2	43.80	9.17	56.43	II	II	53.31	I	I	0.85
62	404	6.2	2220	33.4	33.10	8.34	90.22	III	III	80.83	I	I	1.13
63	405	12.7	2790	47.3	47.10	5.44	25.37	I	I	22.14	I	I	0.44
64	406	8.2	2215	30.3	29.90	4.90	44.54	I	I	35.10	I	I	0.64
65	407	7.6	1015	27.4	26.90	12.46	61.86	I	I	26.73	I	I	0.25
66	408	16.5	5657	48.4	48.10	13.29	94.73	III	III	88.17	II	II	2.03
67	409	9.5	3450	36.7	36.30	7.94	79.43	III	III	75.85	II	II	1.72
68	410	3.4	373	39.7	39.50	7.01	19.47	I	I	18.24	I	I	0.53
69	411	7.2	1635	33.5	33.00	13.77	94.75	III	III	91.87	I	I	1.57
70	412	6.6	1950	49.2	48.80	6.96	42.14	II	II	39.12	I	I	0.86
71	413	8.5	1470	30.9	30.40	5.83	33.17	I	I	31.65	I	I	0.66
72	414	11.3	785	38.4	38.00	9.58	17.51	I	I	14.49	I	I	0.29
73	415	9.5	880	40.0	39.80	9.20	21.41	I	I	15.76	I	I	0.54
74	416	8.5	1027	50.8	50.40	12.82	30.73	I	I	17.65	I	I	0.46
75	417	7.5	585	33.1	32.70	10.11	24.11	I	I	14.05	I	I	0.52
76	418	11.7	785	33.2	32.90	8.89	18.13	I	I	10.55	I	I	0.30
77	419	6.1	1713	40.1	39.90	11.23	79.04	II	III	57.55	I	I	1.37
	419	6.1	1713	40.1	39.90	11.23	79.04	II	III	57.34	I	I	1.40
78	420	7.9	2130	32.8	32.60	6.54	54.09	II	II	49.90	I	I	0.99
79	421	5.1	585	51.0	50.70	16.05	36.31	I	I	33.17	I	I	0.67
80	422	9.9	1605	38.4	38.10	10.01	42.59	II	II	39.38	I	I	0.77
81	423	9.1	2320	33.8	33.40	8.42	64.27	III	III	56.96	I	I	0.83
82	424	11.7	2156	30.6	30.40	4.49	27.22	I	I	25.93	I	I	0.47
83	425	16.8	9800	38.5	38.20	4.59	70.09	III	III	66.68	I	I	1.10
84	426	13.7	7665	41.4	41.10	5.19	70.65	III	III	66.02	I	I	1.39
85	427	7.4	2310	47.0	46.70	20.04	133.95	III	III	56.23	II	I	1.57
	427	7.4	2310	47.0	46.70	20.04	133.95	III	III	55.80	II	I	1.45
86	428	5.3	1575	32.2	31.80	10.04	93.82	III	III	86.49	II	II	1.92
87	429	11.0	2110	45.4	45.20	13.18	55.93	III	II	53.73	I	I	1.08
	429	11.0	2110	45.4	45.20	13.18	55.93	III	II	53.70	I	I	1.01
88	430	9.3	2000	40.6	40.30	11.52	61.47	III	III	59.12	I	I	0.01
89	431	7.9	1870	39.1	38.80	11.52	70.28	III	III	64.55	I	I	1.22
90	432	6.1	1675	33.9	33.50	17.96	147.21	III*	III*	139.10	II	II	2.71



**Appendix 2-13 Chemical Analysis of Check Samples  
for TiO<sub>2</sub> and ZrO<sub>2</sub>**



Appendix 2-13 Chemical Analysis of Check Samples for TiO<sub>2</sub> and ZrO<sub>2</sub>

						Assay results (%)	
No.	No. of drillholes	Sample No.	Sampling position (m)			X-Ray spectral	
			from		to	ZrO <sub>2</sub>	TiO <sub>2</sub>
1	MJBKS-29	3g_8_1x	9.0	-	10.0	0.008	0.89
2	MJBKS-29	3g_8_2x	12.0	-	13.0	0.007	0.71
3	MJBKS-29	3g_8_3x	13.0	-	14.0	0.006	0.85
4	MJBKS-29	3g_8_4x	14.0	-	15.0	0.008	1.24
5	MJBKS-26	2a_4_1x	11.0	-	12.0	0.007	1.03
6	MJBKS-26	2a_4_2x	12.0	-	13.0	0.007	2.61
7	MJBKS-26	2a_4_3x	13.0	-	14.0	0.007	0.92
8	MJBKS-28	2a_8_1x	11.0	-	12.0	0.008	1.11
9	MJBKS-28	2a_8_2x	12.0	-	13.0	0.007	1.10
10	MJBKS-28	2a_8_3x	13.0	-	14.0	0.008	1.13
11	MJBKE-38	X_3_2x	16.0	-	17.0	0.028	1.33
12	MJBKE-38	X_3_3x	17.0	-	18.0	0.035	1.41
13	MJBKE-37	X_2_2x	16.0	-	17.0	0.011	0.71
14	MJBKE-13	III_36_5x	38.2	-	39.2	0.019	0.62



**Appendix 2-14 Grainmetric Analysis of  
Monomineral Fraction of Ilmenite**



Appendix 2-14 Grainmetric Analysis of Monomineral Fraction of Ilmenite

No.	Hole No.	Depth (m)	Class of granulation (mm)													
			-0.63	-0.40	-0.25	-0.20	-0.16	-0.125	-0.10	-0.09	-0.080	-0.07	-0.06	-0.05	-0.04	total
			+0.40	+0.25	+0.20	+0.16	+0.125	+0.10	+0.09	+0.080	+0.07	+0.06	+0.05	+0.04	+0.00	
1	MJBK-52	44.8 - 46.4	0.11	4.97	14.73	27.81	26.24	12.80	5.34	3.22	0.18	2.76	1.29	0.37	0.18	100.00
2	MJBK-50	38.5 - 42.0	0.46	17.59	19.06	20.60	19.29	9.65	5.17	3.47	0.15	2.39	1.62	0.31	0.24	100.00
3	MJBK-50	49.0 - 52.0	0.19	4.93	11.44	24.09	25.02	15.81	7.44	5.49	0.09	2.98	1.95	0.28	0.29	100.00
4	MJBK-50	54.6 - 57.2	1.03	12.57	17.23	23.24	20.24	11.07	5.30	3.95	0.24	2.92	1.42	0.47	0.32	100.00
5	MJBK-49	39.5 - 41.6	0.01	2.46	9.00	23.17	26.73	15.34	8.09	5.57	0.32	5.05	2.78	0.97	0.51	100.00
6	MJBK-49	48.0 - 52.4	0.58	14.23	20.87	23.15	20.87	9.43	4.32	2.72	0.14	2.32	0.95	0.24	0.18	100.00
7	MJBK-48	48.6 - 49.5	0.98	25.37	20.59	20.98	13.07	10.15	3.41	2.15	0.10	2.15	0.68	0.10	0.27	100.00
8	MJBK-54	54.3 - 57.6	1.11	11.40	17.97	20.79	24.74	12.17	5.34	2.67	0.26	2.34	0.91	0.23	0.07	100.00
9	MJBK-44	48.3 - 51.6	0.69	19.47	23.05	22.99	17.78	7.47	3.45	2.39	0.13	1.70	0.69	0.13	0.06	100.00
10	MJBK-43	41.0 - 43.7	0.11	7.00	15.65	22.65	22.98	13.97	7.11	4.60	0.55	3.61	1.42	0.33	0.20	100.00
11	MJBK-53	56.0 - 57.1	1.07	15.98	23.06	19.27	17.69	10.17	4.93	3.54	0.25	2.40	1.20	0.25	0.19	100.00
12	MJBK-38	60.0 - 62.0	2.15	21.90	21.83	19.97	17.68	8.66	3.72	2.08	0.07	1.29	0.36	0.14	0.15	100.00
13	MJBK-40	46.0 - 48.0	4.06	29.72	25.83	16.68	12.28	5.76	2.79	1.35	0.17	0.85	0.34	0.08	0.09	100.00
14	MJBKS-29	32.0 - 34.2	-	3.45	11.49	22.22	26.05	17.82	8.24	3.45	0.38	4.02	2.30	0.38	0.20	100.00
15	MJBKS-31	33.5 - 35.5	1.35	16.63	19.34	20.50	18.38	10.83	5.22	3.09	0.19	2.32	1.16	0.19	0.80	100.00
16	MJBKE-35	9.3 - 13.7	1.63	10.03	13.82	10.57	19.51	17.89	9.76	9.02	-	4.88	2.17	0.54	0.18	100.00



**Appendix 2-15 Grainmetric Analysis of  
Monomineral Fraction of Zircon**



Appendix 2-15 Grainmetric Analysis of Monomineral Fraction of Zircon

No.	Hole No.	Depth (m)	Class of granulation (mm)													
			-0.63	-0.40	-0.25	-0.20	-0.16	-0.125	-0.10	-0.09	-0.080	-0.07	-0.06	-0.05	-0.04	total
			+0.40	+0.25	+0.20	+0.16	+0.125	+0.10	+0.09	+0.080	+0.07	+0.06	+0.05	+0.04	+0.00	
1	MJBK-52	44.8 - 46.4	0.32	6.10	10.72	23.56	21.34	14.09	9.00	3.42	0.32	5.99	3.15	1.00	0.99	100.00
2	MJBK-50	38.5 - 42.0	0.42	6.39	8.91	20.76	19.66	16.34	7.74	6.90	0.27	6.69	4.91	1.01	-	100.00
3	MJBK-50	49.0 - 52.0	0.60	3.36	6.79	14.89	19.86	17.34	9.30	0.53	0.48	10.39	9.13	5.67	1.66	100.00
4	MJBK-50	54.6 - 57.2	0.71	9.60	12.45	21.40	20.57	14.96	8.82	2.93	0.62	4.74	1.23	1.74	0.23	100.00
5	MJBK-49	39.5 - 41.6	-	0.95	2.74	13.49	17.39	17.74	13.21	9.20	1.10	14.72	7.75	1.62	0.09	100.00
6	MJBK-49	48.0 - 52.4	0.58	7.19	11.63	18.93	21.80	16.98	7.84	4.31	0.39	6.87	2.35	0.98	0.15	100.00
7	MJBK-48	48.6 - 49.5	0.90	14.37	14.33	17.34	17.73	13.52	8.09	4.28	0.48	7.33	1.28	0.29	0.06	100.00
8	MJBK-54	54.3 - 57.6	1.87	9.92	10.30	23.57	22.10	15.10	7.54	4.22	0.40	3.85	0.77	0.29	0.07	100.00
9	MJBK-44	48.3 - 51.6	0.45	9.91	18.67	26.36	19.47	11.92	5.67	3.14	0.13	2.84	1.18	0.19	0.07	100.00
10	MJBK-43	41.0 - 43.7	0.62	4.62	7.71	17.76	22.53	17.83	12.46	5.22	0.36	7.68	2.68	0.50	0.03	100.00
11	MJBK-53	56.0 - 57.1	1.05	8.31	13.98	19.63	23.91	12.07	9.12	3.86	0.33	5.22	2.23	0.29	-	100.00
12	MJBK-38	60.0 - 62.0	2.16	17.45	14.57	22.45	18.05	12.69	4.32	5.57	0.22	1.88	0.04	0.32	0.28	100.00
13	MJBK-40	46.0 - 48.0	2.65	22.24	19.32	18.25	16.43	12.86	3.04	3.08	0.23	0.56	0.89	0.09	0.36	100.00
14	MJBKS-29	32.0 - 34.2	-	1.78	6.34	21.87	21.77	20.29	10.69	9.77	1.48	4.05	1.00	0.40	0.56	100.00
15	MJBKS-31	33.5 - 35.5	-	9.73	12.15	26.14	17.20	15.28	7.73	6.50	1.10	2.27	0.83	0.65	0.42	100.00
16	MJBKE-35	9.3 - 13.7	1.11	6.85	6.67	22.67	2.57	28.15	7.86	9.30	1.03	7.58	3.16	0.26	2.79	100.00



**Appendix 2-16 Chemical and Spectral Quantity Analysis  
of Ilmenite**



Appendix 2-16 Chemical and Spectral Quantity Analysis of Ilmenite

No.	Hole No.	Depth (m)	Content (%)											
			Al <sub>2</sub> O <sub>3</sub>	SiO <sub>2</sub>	P <sub>2</sub> O <sub>5</sub>	TiO <sub>2</sub>	Fe <sub>2</sub> O <sub>3</sub>	FeO	Ta <sub>2</sub> O <sub>5</sub>	Nb <sub>2</sub> O <sub>5</sub>	Cr <sub>2</sub> O <sub>5</sub>	V <sub>2</sub> O <sub>5</sub>	Sc <sub>2</sub> O <sub>3</sub>	ΣTR <sub>2</sub> O <sub>3</sub> +Y
1	MJBK-52	44.8 - 46.4	1.04	2.39	0.010	49.51	43.6	14.01	<0,0005	0.001	0.0169	0.182	0.0021	0.055
2	MJBK-50	38.5 - 42.0	1.08	2.59	0.020	49.01	44.04	20.29	<0,0005	0.001	0.0175	0.157	0.0024	0.057
3	MJBK-50	49.0 - 52.0	0.95	2.25	0.020	48.25	44.12	24.07	<0,0005	0.002	0.0180	0.175	0.0021	0.066
4	MJBK-50	54.6 - 57.2	0.95	2.26	0.020	49.06	43.30	21.91	<0,0005	0.002	0.0203	0.178	0.0022	0.097
5	MJBK-49	39.5 - 41.6	1.06	2.08	0.300	49.39	44.43	22.81	<0,0005	0.002	0.0260	0.188	0.0024	0.079
6	MJBK-49	48.0 - 52.4	0.98	2.18	0.020	48.65	43.93	26.76	<0,0005	0.004	0.0147	0.163	0.0017	0.066
7	MJBK-48	48.6 - 49.5	0.99	2.11	0.030	48.29	44.98	17.24	<0,0005	0.004	0.0235	0.177	0.0018	0.110
8	MJBK-54	54.3 - 57.6	0.80	1.82	0.030	50.40	42.74	12.93	<0,0005	0.006	0.0207	0.198	0.0021	0.062
9	MJBK-44	48.3 - 51.6	0.89	1.98	0.020	49.88	44.45	14.55	<0,0005	0.001	0.0158	0.169	0.0018	0.049
10	MJBK-43	41.0 - 43.7	0.97	2.02	0.020	48.53	45.23	20.11	<0,0005	0.005	0.0184	0.186	0.0020	0.062
11	MJBK-53	56.0 - 57.1	0.72	1.36	0.020	48.76	46.26	26.76	<0,0005	0.005	0.0155	0.161	0.0018	0.067
12	MJBK-38	60.0 - 62.0	0.60	1.16	0.010	50.48	44.92	21.73	<0,0005	0.003	0.0158	0.182	0.0019	0.039
13	MJBK-40	46.0 - 48.0	0.87	2.26	0.020	50.84	43.20	14.55	<0,0005	0.003	0.0197	0.194	0.0018	0.049
14	MJBKS-29	32.0 - 34.2	1.15	2.50	0.030	51.33	40.45	12.03	<0,0005	0.002	0.0610	0.165	0.0022	0.073
15	MJBKS-31	33.5 - 35.5	0.94	2.01	0.030	51.70	41.01	12.39	<0,0005	0.006	0.0420	0.173	0.0021	0.084
16	MJBKE-35	9.3 - 13.7	0.85	2.58	0.020	50.87	39.91	18.32	<0,0005	0.005	0.1560	0.182	0.0017	0.080



**Appendix 2-17 Chemical and Spectral Quantity Analysis  
of Zircon**



Appendix 2-17 Chemical and Spectral Quantity Analysis of Zircon

No.	Hole No.	Depth (m)	Content (%)					
			ZrO <sub>2</sub>	Sc <sub>2</sub> O <sub>3</sub>	Hf	Y	Th	TR <sub>2</sub> O <sub>3</sub>
1	MJBK-52	44.8 - 46.4	59.210	0.0196	0.58	0.046	<0,01	-
2	MJBK-50	38.5 - 42.0	59.300	0.0101	0.51	0.038	<0,01	-
3	MJBK-50	49.0 - 52.0	54.960	0.0092	0.51	0.07	<0,01	-
4	MJBK-50	54.6 - 57.2	61.100	0.0073	0.45	0.036	<0,01	-
5	MJBK-49	39.5 - 41.6	56.600	0.0081	0.53	0.047	<0,01	-
6	MJBK-49	48.0 - 52.4	59.400	0.0078	0.53	0.051	<0,01	-
7	MJBK-48	48.6 - 49.5	62.100	0.0057	0.54	0.04	<0,01	-
8	MJBK-54	54.3 - 57.6	63.870	0.0066	0.51	0.046	<0,01	-
9	MJBK-44	48.3 - 51.6	61.610	0.0075	0.49	0.046	<0,01	-
10	MJBK-43	41.0 - 43.7	60.000	0.0055	0.55	0.041	<0,01	-
11	MJBK-53	56.0 - 57.1	61.500	0.006	0.52	0.036	<0,01	-
12	MJBK-38	60.0 - 62.0	63.700	0.0061	0.43	0.032	<0,01	-
13	MJBK-40	46.0 - 48.0	64.300	0.0064	0.48	0.036	<0,01	-
14	MJBKS-29	32.0 - 34.2	62.100	0.007	0.43	0.037	<0,01	-
15	MJBKS-31	33.5 - 35.5	59.390	0.0075	0.46	0.044	<0,01	-
16	MJBKE-35	9.3 - 13.7	62.100	0.0044	0.56	0.063	<0,01	-



**Appendix 2-18 Round ness of the Opaque Minerals**



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-6 19.74m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸点X	絶対最大長軸点Y	絶対最大長軸点X	絶対最大長軸点Y	楕円長軸	楕円短軸	楕円長短比
1	0.00871	0.10528	0.05264	0.45050	0.03474	0.06947	2.21976	2.03983	0.07960	0.03627	0.05467	0.14783	0.00382	0.00382	0.13503	0.06879	0.13810	0.08026	0.58120
2	0.00058	0.02720	0.01360	0.63439	0.01024	0.02048	1.57633	2.65651	0.02286	0.00838	0.01461	0.04191	0.13630	0.00399	0.15541	0.00382	0.04076	0.01815	0.44512
3	0.00070	0.02994	0.01497	0.52104	0.01021	0.02042	1.91925	3.44118	0.02999	0.00757	0.01731	0.05249	0.22165	0.00382	0.27261	0.00892	0.05296	0.01693	0.31968
4	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.39744	0.00382	0.39999	0.00637	0.00424	0.00424	1.00000
5	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	0.44967	0.00382	0.45349	0.00637	0.00519	0.00477	0.91906
6	0.00206	0.05122	0.02561	0.51185	0.01773	0.03545	1.95369	3.72284	0.05241	0.01388	0.02949	0.09561	0.45986	0.00382	0.54903	0.03439	0.09034	0.02904	0.32148
7	0.00177	0.04748	0.02374	0.30752	0.01257	0.02514	3.25184	5.84416	0.05565	0.00783	0.02957	0.10958	0.63693	0.00382	0.74521	0.00637	0.11108	0.02029	0.18270
8	0.00004	0.00689	0.00345	0.72257	0.00293	0.00586	1.38396	1.67187	0.00452	0.00255	0.00359	0.00891	0.81145	0.00764	0.81782	0.00382	0.00843	0.00563	0.66817
9	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.82164	0.00382	0.82419	0.00637	0.00424	0.00424	1.00000
10	0.00099	0.03553	0.01777	0.32583	0.00954	0.01908	3.06910	4.30716	0.03690	0.00115	0.02115	0.06939	0.83438	0.00637	0.90189	0.01529	0.08506	0.01484	0.17447
11	0.03044	0.19687	0.09844	0.74434	0.08435	0.16870	1.34347	1.59179	0.12759	0.07510	0.09996	0.24671	1.11972	0.07006	1.36430	0.09044	0.24104	0.16079	0.66708
12	0.00498	0.07966	0.03983	0.50395	0.02768	0.05536	1.98434	1.79707	0.05890	0.00459	0.03788	0.10454	1.49296	0.00382	1.56939	0.07261	0.11324	0.05603	0.49482
13	0.00079	0.03169	0.01584	0.63274	0.01203	0.02405	1.58044	2.70712	0.02706	0.00892	0.01714	0.04975	1.82034	0.00382	1.86875	0.00637	0.04890	0.02053	0.41986
14	0.01004	0.11307	0.05654	0.70230	0.04679	0.09357	1.42388	1.57669	0.07474	0.03990	0.05762	0.14020	2.08021	0.03694	2.21651	0.01019	0.14495	0.08820	0.60848
15	0.00359	0.06759	0.03379	0.37448	0.02009	0.04018	2.67036	2.97259	0.06016	0.00117	0.03424	0.11322	2.39995	0.06751	2.49167	0.00382	0.11325	0.04034	0.35617
16	0.01300	0.12867	0.06433	0.28234	0.03361	0.06722	3.54179	3.46386	0.11990	0.00277	0.06431	0.23546	1.89932	0.00510	1.97830	0.22547	0.23260	0.06796	0.27900
17	0.00790	0.10028	0.05014	0.52577	0.03579	0.07157	1.90197	2.44283	0.08366	0.03307	0.05298	0.15427	2.25218	0.05987	2.39995	0.09936	0.14289	0.07037	0.49247
18	0.04001	0.22572	0.11286	0.40056	0.07086	0.14173	2.49648	3.35453	0.23644	0.06592	0.12691	0.41014	0.69680	0.39107	0.89170	0.03185	0.40007	0.12735	0.31832
19	0.02530	0.17948	0.08974	0.29810	0.04842	0.09684	3.35460	2.63481	0.15070	0.00083	0.08854	0.28791	0.41400	0.05223	0.56305	0.29681	0.33816	0.09526	0.28170
20	0.00575	0.08557	0.04279	0.44657	0.02802	0.05603	2.23928	2.30728	0.07268	0.02020	0.04616	0.12737	0.65731	0.18471	0.68788	0.06242	0.13343	0.05488	0.41130
21	0.01089	0.11773	0.05887	0.30008	0.03169	0.06338	3.33239	3.79416	0.11833	0.00161	0.06134	0.22535	1.73245	0.07516	1.83563	0.27388	0.23370	0.05931	0.25379
22	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	0.03185	0.09299	0.03694	0.09681	0.00712	0.00580	0.81492
23	0.00600	0.08741	0.04370	0.67114	0.03522	0.07044	1.49001	1.46786	0.05417	0.03301	0.04404	0.10417	2.00888	0.09936	2.05983	0.18853	0.10376	0.07364	0.70968
24	0.01267	0.12699	0.06349	0.53713	0.04597	0.09194	1.86173	2.19167	0.09607	0.03570	0.06635	0.18571	2.14391	0.18471	2.31333	0.11210	0.18510	0.08712	0.47067
25	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.02038	0.09936	0.22293	0.10191	0.00424	0.00424	1.00000
26	0.01607	0.14306	0.07153	0.33307	0.04071	0.08141	3.00238	2.33719	0.12683	0.00962	0.07448	0.21566	2.36938	0.18089	2.56300	0.27261	0.25503	0.08025	0.31468
27	0.00693	0.09392	0.04696	0.70742	0.03891	0.07781	1.41359	2.00057	0.06703	0.03298	0.04815	0.13085	0.13758	0.20382	0.24458	0.13121	0.12185	0.07239	0.59405
28	0.00532	0.08231	0.04115	0.38031	0.02481	0.04962	2.62945	3.47253	0.07910	0.01841	0.04847	0.14993	0.26751	0.13503	0.38088	0.23057	0.15832	0.04279	0.27029
29	0.00059	0.02735	0.01367	0.77725	0.01150	0.02300	1.28659	2.17206	0.02009	0.00868	0.01429	0.03845	2.10951	0.16051	2.14263	0.14395	0.03777	0.01980	0.52442
30	0.00088	0.03349	0.01675	0.73762	0.01381	0.02762	1.35571	1.95640	0.02349	0.01039	0.01730	0.04498	0.05095	0.17707	0.08790	0.15414	0.04448	0.02522	0.56712
31	0.00116	0.03841	0.01920	0.30168	0.00996	0.01992	3.31472	2.80220	0.03047	0.00621	0.01900	0.06071	0.95157	0.18344	0.99871	0.14777	0.06238	0.02365	0.37909
32	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	0.95030	0.16178	0.95412	0.16560	0.00572	0.00572	1.00000
33	0.00189	0.04902	0.02451	0.49298	0.01662	0.03324	2.02848	2.39080	0.04339	0.01572	0.02689	0.07321	0.00382	0.16433	0.03439	0.22929	0.07307	0.03288	0.45003
34	0.00007	0.00964	0.00482	0.90138	0.00398	0.00796	1.10941	2.23268	0.00635	0.00366	0.00498	0.01252	0.98979	0.18471	0.99616	0.17579	0.01155	0.00805	0.69676
35	0.00044	0.02366	0.01183	0.76530	0.00978	0.01956	1.30668	2.29697	0.01855	0.00856	0.01248	0.03389	0.27006	0.18089	0.29936	0.19490	0.03245	0.01725	0.53159
36	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	2.04709	0.18981	2.04964	0.19235	0.00424	0.00424	1.00000
37	0.01548	0.14039	0.07019	0.68449	0.05750	0.11501	1.46094	1.50143	0.09723	0.05095	0.07125	0.17033	1.09934	0.33630	1.20380	0.20382	0.17298	0.11394	0.65868
38	0.00825	0.10250	0.05125	0.50188	0.03573	0.07147	1.99253	2.34685	0.08246	0.02949	0.05364	0.15454	2.05219	0.29936	2.17830	0.21273	0.15089	0.06963	0.46143
39	0.00437	0.07458	0.03729	0.47282	0.02507	0.05015	2.11496	3.72277	0.07252	0.01684	0.04279	0.14071	0.89552	0.20000	1.00635	0.28407	0.13887	0.04002	0.28798
40	0.00191	0.04925	0.02463	0.31162	0.01318	0.02637	3.20903	5.93301	0.06618	0.00309	0.03375	0.11506	1.28023	0.21783	1.31080	0.32738	0.12762	0.01901	0.14893
41	0.01943	0.15728	0.07864	0.50897	0.05554	0.11107	1.96477	1.72146	0.11154	0.03502	0.07675	0.20427	0.07006	0.28407	0.25350	0.37069	0.21185	0.11677	0.55118
42	0.00033	0.02053	0.01027	0.69267	0.00796	0.01592	1.44369	2.27189	0.01472	0.00510	0.01053	0.02882	2.24454	0.24968	2.26365	0.23057	0.02734	0.01542	0.56391
43	0.00033	0.02063	0.01032	0.28725	0.00496	0.00991	3.48125	7.45834	0.02597	0.00371	0.01457	0.05050	2.27002	0.23057	2.28403	0.27770	0.05409	0.00787	0.14547
44	0.00974	0.11135	0.05567	0.68719	0.04557	0.09114	1.45520	1.72297	0.07993	0.03272	0.05636	0.14431	1.51589	0.25987	1.59742	0.37706	0.14392	0.08615	0.59859
45	0.01674	0.14600	0.07300	0.71545	0.06118	0.12235	1.39771	1.61509	0.09679	0.05309	0.07489	0.18383	1.12991	0.38598	1.25348	0.25222	0.18207	0.11707	0.64300
46	0.00016	0.01437	0.00719	0.44001	0.00418	0.00837	2.27266	4.98157	0.01510	0.00312	0.00873	0.02815	0.00382	0.25222	0.00637	0.27898	0.02907	0.00711	0.24457
47	0.03773	0.21919	0.10959	0.31232	0.06067	0.12133	3.20181	2.95744	0.21334	0.05391	0.12064	0.37337	1.63181	0.60126	1.82799	0.28534	0.40133	0.11971	0.29828
48	0.00369	0.06859	0.03429	0.62916	0.02662	0.05323	1.58943	1.70403	0.04826	0.01580	0.03416	0.08761	1.38341	0.32356	1.43819	0.25732	0.08761	0.05370	0.61299
49	0.00011	0.01159	0.00579	0.84172	0.00471	0.00942	1.18804	2.01530	0.00752	0.00430	0.00597	0.01457	2.24581	0.25859	2.25218	0.27006	0.01461	0.00919	0.62936
50	0.00019	0.01561	0.00781	0.78248	0.00631	0.01262	1.27798	2.24257	0.01118	0.00568	0.00810	0.02136	2.41778	0.26751	2.43562	0.25859	0.02147	0.01136	0.52904
51	0.01403	0.13365	0.06682	0.26															



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-6 19.74m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸X	絶対最大長軸Y	絶対最大長軸Z	絶対最大長軸V	楕円長軸	楕円短軸	楕円長短比
52	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.00382	0.28280	0.00637	0.28534	0.00424	0.00424	1.00000
53	0.00057	0.02693	0.01346	0.55426	0.00944	0.01889	1.80421	3.27129	0.02347	0.00556	0.01497	0.04588	2.25983	0.32611	2.27766	0.28534	0.04626	0.01568	0.33889
54	0.01258	0.12656	0.06328	0.23431	0.03004	0.06009	4.26781	1.73256	0.09054	0.00432	0.05442	0.16339	2.10059	0.33248	2.22925	0.43056	0.18774	0.08531	0.45442
55	0.00402	0.07151	0.03575	0.38186	0.02150	0.04301	2.61878	2.02608	0.05428	0.01746	0.03576	0.09907	1.93881	0.30700	2.00888	0.37451	0.09742	0.05249	0.53880
56	0.00584	0.08623	0.04312	0.63112	0.03365	0.06731	1.58449	1.94375	0.06617	0.03166	0.04466	0.11813	2.53880	0.40509	2.60377	0.30827	0.10849	0.06854	0.63182
57	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.00382	0.28280	0.00637	0.28534	0.00424	0.00424	1.00000
58	0.00006	0.00886	0.00443	0.70832	0.00314	0.00629	1.41180	3.23209	0.00671	0.00269	0.00474	0.01343	2.27893	0.32993	2.28276	0.31846	0.01406	0.00558	0.39711
59	0.00006	0.00886	0.00443	0.70832	0.00314	0.00629	1.41180	3.23209	0.00671	0.00269	0.00474	0.01343	2.27893	0.32993	2.28276	0.31846	0.01406	0.00558	0.39711
59	0.00006	0.00886	0.00443	0.70832	0.00314	0.00629	1.41180	3.23209	0.00671	0.00269	0.00474	0.01343	2.27893	0.32993	2.28276	0.31846	0.01406	0.00558	0.39711
60	0.00914	0.10790	0.05395	0.63135	0.04229	0.08459	1.58391	1.66148	0.07547	0.03770	0.05474	0.13722	1.83563	0.34776	1.91206	0.45986	0.13578	0.08575	0.63154
61	0.00838	0.10327	0.05164	0.43780	0.03360	0.06719	2.28416	2.52080	0.08859	0.03027	0.05683	0.16123	0.83565	0.48279	0.94775	0.36942	0.16393	0.06506	0.39689
62	0.00490	0.07902	0.03951	0.56113	0.02903	0.05805	1.78212	2.36458	0.06641	0.01668	0.04096	0.11917	2.06493	0.35923	2.10824	0.46878	0.11402	0.05476	0.48030
63	0.00042	0.02300	0.01150	0.92633	0.01051	0.02103	1.07953	1.41302	0.01338	0.01046	0.01169	0.02597	0.42292	0.38471	0.43184	0.36178	0.02496	0.02119	0.84903
64	0.00120	0.03915	0.01958	0.33241	0.01069	0.02138	3.00834	6.17633	0.05099	0.00754	0.02641	0.09215	0.11083	0.37834	0.19872	0.40127	0.09879	0.01552	0.15709
65	0.00615	0.08846	0.04423	0.68481	0.03604	0.07207	1.46026	2.03220	0.06337	0.02886	0.04548	0.12416	2.29422	0.52993	2.34135	0.41655	0.12060	0.06488	0.53800
66	0.01194	0.12331	0.06165	0.61739	0.04786	0.09571	1.61971	1.73604	0.08416	0.04568	0.06357	0.16050	0.44585	0.44458	0.55158	0.56305	0.16036	0.09481	0.59124
67	0.00162	0.04539	0.02269	0.75880	0.01919	0.03839	1.31787	1.97890	0.03443	0.01561	0.02339	0.06199	1.53755	0.47897	1.56812	0.42674	0.05928	0.03475	0.58628
68	0.01348	0.13100	0.06550	0.36281	0.03888	0.07775	2.75630	2.50422	0.11118	0.02890	0.07000	0.20427	1.25857	0.48407	1.44201	0.57069	0.21246	0.08077	0.38018
69	0.01385	0.13281	0.06640	0.67964	0.05417	0.10834	1.47136	1.63467	0.08777	0.04348	0.06712	0.16803	1.96174	0.59362	2.06875	0.46623	0.16652	0.10593	0.63613
70	0.00591	0.08675	0.04337	0.47340	0.02926	0.05852	2.11238	2.17497	0.07090	0.02745	0.04534	0.12543	2.56300	0.46241	2.59995	0.58088	0.12454	0.06042	0.48515
71	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.04586	0.46496	0.05095	0.47005	0.00757	0.00683	0.90212
72	0.00009	0.01085	0.00543	0.89418	0.00453	0.00907	1.11835	2.23375	0.00721	0.00444	0.00561	0.01433	0.08153	0.46751	0.09172	0.47515	0.01306	0.00902	0.69067
73	0.00022	0.01689	0.00844	0.65220	0.00622	0.01245	1.53328	2.48841	0.01335	0.00464	0.00904	0.02432	1.56812	0.46878	1.57576	0.49044	0.02649	0.01076	0.40641
74	0.01055	0.11590	0.05795	0.60472	0.04449	0.08898	1.65367	1.94661	0.08770	0.02975	0.05967	0.15965	0.13630	0.47388	0.21656	0.61018	0.16083	0.08353	0.51933
75	0.00007	0.00920	0.00460	0.92484	0.00382	0.00763	1.08127	2.13803	0.00581	0.00375	0.00472	0.01161	0.63948	0.48407	0.64585	0.47642	0.01034	0.00819	0.79161
76	0.00008	0.00985	0.00493	0.89248	0.00405	0.00809	1.12048	2.13834	0.00629	0.00381	0.00506	0.01252	2.52479	0.48534	2.53371	0.47897	0.01173	0.00828	0.70594
77	0.00345	0.06623	0.03311	0.66146	0.02637	0.05274	1.51180	2.26967	0.05271	0.02089	0.03513	0.09770	1.11972	0.48024	1.16176	0.56687	0.09618	0.04560	0.47412
78	0.01351	0.13117	0.06559	0.31182	0.03605	0.07210	3.20699	2.52492	0.10797	0.02541	0.07091	0.20516	0.29299	0.69680	0.33248	0.49681	0.20938	0.08218	0.39247
79	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.00382	0.28280	0.00637	0.28534	0.00424	0.00424	1.00000
80	0.01600	0.14273	0.07136	0.24185	0.03453	0.06906	4.13487	2.06411	0.10816	0.01319	0.06688	0.20176	2.33753	0.55413	2.53753	0.54012	0.21660	0.09405	0.43421
81	0.00020	0.01594	0.00797	0.80763	0.00657	0.01314	1.23820	2.41299	0.01151	0.00565	0.00836	0.02272	1.77194	0.52483	1.78340	0.50700	0.02172	0.01170	0.53883
82	0.01001	0.11287	0.05643	0.66283	0.04536	0.09073	1.50867	1.72589	0.08248	0.03812	0.05816	0.14640	1.89678	0.54649	1.97448	0.66878	0.14917	0.08540	0.57251
83	0.01680	0.14627	0.07313	0.40019	0.04569	0.09139	2.49880	2.05249	0.10390	0.03531	0.07134	0.20696	0.02548	0.57451	0.10446	0.76432	0.20480	0.10446	0.51008
84	0.00025	0.01790	0.00895	0.80906	0.00744	0.01488	1.23600	1.84792	0.01174	0.00663	0.00922	0.02249	1.07896	0.57578	1.09807	0.58470	0.02285	0.01401	0.61327
85	0.00006	0.00862	0.00431	0.92163	0.00352	0.00704	1.08504	2.17495	0.00540	0.00390	0.00442	0.01081	1.24966	0.57706	1.25603	0.58343	0.00948	0.00784	0.82694
86	0.00075	0.03083	0.01541	0.45275	0.00980	0.01961	2.20874	4.17303	0.03327	0.00558	0.01823	0.05953	1.01781	0.60763	1.07004	0.58215	0.06156	0.01544	0.25077
87	0.00704	0.09467	0.04734	0.58308	0.03558	0.07116	1.71504	1.93126	0.06692	0.03069	0.04824	0.12951	1.50188	0.59362	1.61143	0.65986	0.13110	0.06837	0.52147
88	0.00724	0.09599	0.04800	0.61008	0.03690	0.07381	1.63912	1.85090	0.06943	0.03377	0.04838	0.12855	1.73882	0.60126	1.83818	0.68024	0.12264	0.07514	0.61269
89	0.03148	0.20021	0.10010	0.35752	0.05928	0.11855	2.79703	3.06602	0.17554	0.01372	0.10245	0.34718	0.97832	0.95794	1.02546	0.61527	0.38897	0.10305	0.26492
90	0.01697	0.14697	0.07349	0.58143	0.05546	0.11093	1.71989	1.38864	0.09094	0.04525	0.07310	0.17143	0.58215	0.61910	0.61527	0.78597	0.18165	0.11892	0.65465
91	0.02401	0.17485	0.08742	0.36042	0.05192	0.10384	2.77452	2.13366	0.13539	0.04854	0.09320	0.25264	2.23435	0.61782	2.28658	0.86368	0.25392	0.12040	0.47416
92	0.00297	0.06147	0.03074	0.27019	0.01541	0.03082	3.70107	2.87668	0.05537	0.01264	0.03334	0.10055	2.42288	0.63566	2.51205	0.67897	0.10697	0.03533	0.33024
93	0.00695	0.09405	0.04702	0.46685	0.03156	0.06312	2.14202	2.17729	0.06979	0.02892	0.04842	0.13631	0.34267	0.78342	0.38725	0.65604	0.12602	0.07019	0.55697
94	0.00281	0.05979	0.02989	0.53775	0.02135	0.04269	1.85959	2.26365	0.04914	0.01728	0.03128	0.08759	1.20889	0.76049	1.23310	0.67769	0.08828	0.04049	0.45865
95	0.01745	0.14905	0.07452	0.47079	0.05056	0.10111	2.12410	1.94226	0.10557	0.04551	0.07697	0.20538	2.45091	0.86495	2.54008	0.68151	0.20000	0.11107	0.55538
96	0.00051	0.02543	0.01272	0.36478	0.00713	0.01425	2.74134	2.76352	0.02313	0.00090	0.01412	0.03923	1.71716	0.72355	1.72990	0.68788	0.04671	0.01385	0.29643
97	0.00252	0.05663	0.02831	0.33628	0.01585	0.03169	2.93771	2.43118	0.05014	0.00472	0.02913	0.08521	1.72226	0.74903	1.79869	0.71463	0.09596	0.03342	0.34822
98	0.00951	0.11003	0.05502	0.57868	0.04128	0.08256	1.72806	2.71245	0.09109	0.03736	0.05933	0.17874	1.84455	0.75158	2.02034	0.72737	0.16344	0.07408	0.45325
99	0.00004	0.00733	0.00366	0.67505	0.00301	0.00602	1.48137	1.78346	0.00493	0.00309	0.00385	0.00979	1.73117	0.70954	1.73754	0.71463	0.00852	0.00630	0.73920
100	0.00900	0.10703	0.05351	0.66024	0.04292	0.08583	1.51459	1.47894	0.06685	0.03345	0.05384	0.12846	1.18081	0.83820	1.13501	0.71336	0.13103	0.08742	0.66722
101	0.00002	0.00498	0.00249																



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-6 19.74m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾角X	絶対最大長傾角Y	絶対最大長傾角X	絶対最大長傾角Y	楕円長軸	楕円短軸	楕円長短比
103	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	0.32738	0.72355	0.33248	0.72737	0.00712	0.00580	0.81492
104	0.00006	0.00909	0.00455	0.84003	0.00355	0.00709	1.19043	2.29927	0.00587	0.00328	0.00470	0.01174	1.74264	0.72865	1.74773	0.73756	0.01180	0.00701	0.59392
105	0.00045	0.02401	0.01200	0.83069	0.01037	0.02073	1.20381	1.67449	0.01631	0.00903	0.01228	0.02944	1.80506	0.73756	1.81907	0.76177	0.02880	0.02001	0.69479
106	0.03157	0.20050	0.10025	0.20202	0.04449	0.08898	4.95004	3.44784	0.20689	0.00201	0.10706	0.36759	1.50570	0.75285	1.62799	1.09807	0.40018	0.10046	0.25103
107	0.01599	0.14267	0.07134	0.56240	0.05293	0.10586	1.77809	1.76942	0.10547	0.03260	0.07394	0.18777	1.15029	0.90699	1.32354	0.83820	0.20552	0.09904	0.48193
108	0.00573	0.08545	0.04272	0.81476	0.03801	0.07601	1.22736	1.39045	0.05293	0.03819	0.04319	0.09930	0.43311	0.76686	0.44840	0.86368	0.09563	0.07635	0.79837
109	0.00707	0.09489	0.04744	0.26338	0.02377	0.04754	3.79683	3.48612	0.08905	0.00851	0.05103	0.17296	2.32352	0.96559	2.40377	0.81400	0.18979	0.04744	0.24998
110	0.00110	0.03737	0.01869	0.32752	0.01012	0.02023	3.05321	6.22299	0.04706	0.00769	0.02523	0.08820	1.87257	0.84966	1.95283	0.81654	0.08303	0.01682	0.20261
111	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.00382	0.82164	0.00637	0.82419	0.00424	0.00424	1.00000
112	0.00025	0.01778	0.00889	0.82406	0.00748	0.01496	1.21350	1.86331	0.01217	0.00640	0.00910	0.02250	1.13501	0.83056	1.15157	0.84329	0.02142	0.01476	0.68873
113	0.00005	0.00774	0.00387	0.75294	0.00336	0.00672	1.32812	1.59896	0.00491	0.00317	0.00398	0.00979	2.42925	0.83693	2.43434	0.83056	0.00861	0.00696	0.80817
114	0.00012	0.01253	0.00627	0.86152	0.00523	0.01046	1.16074	2.10155	0.00882	0.00468	0.00648	0.01634	0.00382	0.84457	0.01146	0.83183	0.01554	0.01011	0.65043
115	0.00724	0.09600	0.04800	0.73770	0.04066	0.08131	1.35556	1.82334	0.06653	0.03553	0.04884	0.12784	1.93881	0.85603	2.05856	0.89680	0.11835	0.07788	0.65808
116	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	1.12354	0.83820	1.12609	0.84202	0.00519	0.00477	0.91906
117	0.00008	0.01027	0.00513	0.74151	0.00384	0.00768	1.34859	2.91751	0.00801	0.00287	0.00541	0.01523	0.11465	0.84329	0.12356	0.85349	0.01444	0.00730	0.50564
118	0.00080	0.03185	0.01593	0.52478	0.01096	0.02193	1.90556	2.87419	0.02644	0.00739	0.01683	0.05132	0.50827	0.87896	0.54266	0.84329	0.05049	0.02009	0.39787
119	0.00102	0.03599	0.01800	0.65014	0.01391	0.02783	1.53814	2.40606	0.02864	0.00877	0.01931	0.05353	2.09932	0.89680	2.11078	0.84584	0.05743	0.02256	0.39276
120	0.01959	0.15792	0.07896	0.38081	0.04816	0.09631	2.62600	3.19536	0.14930	0.02385	0.08272	0.27899	0.39107	0.85221	0.60126	1.03310	0.26952	0.09254	0.34334
121	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.10446	0.85221	0.10700	0.85476	0.00424	0.00424	1.00000
122	0.00025	0.01790	0.00895	0.34118	0.00467	0.00935	2.93097	2.85815	0.01535	0.00227	0.00924	0.02706	0.10318	0.87896	0.11465	0.85603	0.02928	0.01094	0.37361
123	0.00078	0.03156	0.01578	0.29815	0.00803	0.01607	3.35397	2.60196	0.02490	0.00143	0.01580	0.04746	0.00892	0.89552	0.03439	0.85731	0.04949	0.02012	0.40664
124	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.13248	0.85731	0.13503	0.85985	0.00424	0.00424	1.00000
125	0.00021	0.01620	0.00810	0.49255	0.00511	0.01021	2.03025	3.27722	0.01540	0.00390	0.00910	0.02634	0.04204	0.85858	0.06624	0.86495	0.02740	0.00958	0.34954
126	0.00456	0.07620	0.03810	0.60459	0.02906	0.05812	1.65401	2.27596	0.05682	0.01436	0.03967	0.11277	2.51969	0.94011	2.60377	0.86750	0.11769	0.04933	0.41917
127	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	0.17452	0.86113	0.17834	0.86622	0.00712	0.00580	0.81492
128	0.00971	0.11120	0.05560	0.08512	0.01565	0.03130	11.74761	2.94289	0.09526	0.00692	0.05771	0.18404	0.04968	0.95794	0.21783	0.88661	0.20885	0.05921	0.28351
129	0.00006	0.00838	0.00419	0.84776	0.00331	0.00662	1.17958	3.07876	0.00635	0.00291	0.00457	0.01261	1.4522	0.87896	0.15286	0.87132	0.01175	0.00598	0.50853
130	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.12484	0.87642	0.12739	0.87896	0.00424	0.00424	1.00000
131	0.00002	0.00557	0.00278	0.73631	0.00239	0.00478	1.35812	1.63625	0.00356	0.00191	0.00294	0.00712	0.09554	0.87769	0.09809	0.88278	0.00707	0.00438	0.61930
132	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	1.14775	0.87769	1.15157	0.88151	0.00572	0.00572	1.00000
133	0.00003	0.00610	0.00305	0.69813	0.00255	0.00510	1.43239	1.82212	0.00412	0.00214	0.00321	0.00823	0.03567	0.88278	0.04204	0.88533	0.00863	0.00431	0.49945
134	0.00038	0.02189	0.01095	0.85702	0.00955	0.01910	1.16684	1.72163	0.01507	0.00858	0.01119	0.02707	0.87005	0.88278	0.89043	0.89807	0.02581	0.01857	0.71981
135	0.00760	0.09839	0.04919	0.69238	0.04035	0.08071	1.44429	1.60804	0.06469	0.03074	0.04965	0.12300	1.87639	0.88406	1.97066	0.96049	0.12356	0.07834	0.63406
136	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	0.07261	0.88533	0.07643	0.88915	0.00572	0.00572	1.00000
137	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	0.12484	0.88788	0.12866	0.89043	0.00519	0.00477	0.91906
138	0.00013	0.01294	0.00647	0.70527	0.00485	0.00969	1.41790	2.89503	0.01013	0.00465	0.00693	0.01964	0.10191	0.90189	0.11847	0.89425	0.01904	0.00879	0.46147
139	0.01271	0.12721	0.06360	0.22391	0.02951	0.05902	4.46609	4.53831	0.13420	0.01566	0.07238	0.26572	1.68786	0.89552	1.87512	1.08151	0.26445	0.06119	0.23138
140	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.05987	0.90062	0.06242	0.90317	0.00424	0.00424	1.00000
141	0.00005	0.00800	0.00400	0.94465	0.00331	0.00663	1.05859	2.47061	0.00544	0.00307	0.00419	0.01072	0.04713	0.90317	0.05223	0.91081	0.00974	0.00658	0.67513
142	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	0.01401	0.90444	0.01656	0.90826	0.00519	0.00477	0.91906
143	0.00010	0.01132	0.00566	0.90190	0.00478	0.00956	1.10876	2.29233	0.00768	0.00489	0.00586	0.01523	0.12102	0.91463	0.13121	0.90571	0.01347	0.00951	0.70558
144	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.03694	0.91081	0.03949	0.91336	0.00424	0.00424	1.00000
145	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	0.24076	0.91718	0.24458	0.91973	0.00519	0.00477	0.91906
146	0.00004	0.00704	0.00352	0.75398	0.00306	0.00611	1.32629	1.60221	0.00446	0.00269	0.00366	0.00891	1.40379	0.91845	1.40761	0.92482	0.00870	0.00570	0.65504
147	0.00006	0.00862	0.00431	0.92172	0.00355	0.00710	1.08493	2.46075	0.00585	0.00347	0.00450	0.01161	0.11337	0.92100	0.12102	0.92737	0.01044	0.00713	0.68295
148	0.00036	0.02132	0.01066	0.35752	0.00580	0.01159	2.79704	3.26225	0.01974	0.00419	0.01205	0.03502	0.03185	0.95539	0.03822	0.92227	0.03782	0.01202	0.31786
149	0.00007	0.00975	0.00487	0.94326	0.00413	0.00826	1.06015	2.19911	0.00631	0.00438	0.00500	0.01261	0.24585	0.92992	0.25350	0.92227	0.01071	0.00888	0.82892
150	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.23312	0.92355	0.23566	0.92610	0.00424	0.00424	1.00000
151	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	1.43564	0.92482	1.43946	0.92737	0.00519	0.00477	0.91906
152	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.16560	0.92610	0.16815	0.92864	0.00424	0.00424	1.000



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-6 19.74m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾点X	絶対最大長傾点Y	絶対最大長傾点X	絶対最大長傾点Y	楕円長軸	楕円短軸	楕円長短比
154	0.00010	0.01132	0.00566	0.55162	0.00362	0.00724	1.81285	3.73935	0.00990	0.00254	0.00623	0.01885	0.21528	0.93501	0.22675	0.94775	0.01949	0.00657	0.33726
155	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.16688	0.93629	0.16942	0.93883	0.00424	0.00424	1.00000
156	0.00066	0.02893	0.01446	0.61302	0.01074	0.02149	1.63128	2.45808	0.02311	0.00865	0.01556	0.04303	1.60124	0.97323	1.62035	0.93629	0.04314	0.01940	0.44968
157	0.00012	0.01228	0.00614	0.84590	0.00506	0.01011	1.18218	2.40335	0.00855	0.00434	0.00639	0.01704	0.23821	0.94775	0.24968	0.93756	0.01561	0.00966	0.61891
158	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	1.11463	0.94775	1.12100	0.95285	0.00889	0.00697	0.78403
159	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	0.23566	0.95285	0.23821	0.95667	0.00519	0.00477	0.91906
160	0.02627	0.18288	0.09144	0.45575	0.06116	0.12231	2.19418	2.16995	0.14527	0.05794	0.09671	0.26689	1.23946	1.02800	1.50315	1.05985	0.26016	0.12856	0.49417
161	0.00802	0.10104	0.05052	0.52947	0.03619	0.07238	1.88867	2.57781	0.08940	0.02479	0.05415	0.15971	1.97830	0.96813	2.03181	1.11717	0.15266	0.06687	0.43802
162	0.00177	0.04748	0.02374	0.52809	0.01666	0.03333	1.89363	2.71126	0.04195	0.01158	0.02614	0.07552	2.32479	0.99106	2.39613	1.01144	0.07820	0.02883	0.36864
163	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	0.18089	0.97323	0.18471	0.97832	0.00712	0.00580	0.81492
164	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	1.08660	0.97960	1.09042	0.98342	0.00572	0.00572	1.00000
165	0.00003	0.00610	0.00305	0.69813	0.00255	0.00510	1.43239	1.82212	0.00412	0.00214	0.00321	0.00823	1.04966	0.98087	1.05221	0.98724	0.00863	0.00431	0.49945
166	0.01090	0.11779	0.05889	0.56805	0.04382	0.08764	1.76039	1.77963	0.08318	0.03295	0.05904	0.15513	2.14773	1.06240	2.29040	1.00507	0.15161	0.09151	0.60356
167	0.00003	0.00610	0.00305	0.69813	0.00255	0.00510	1.43239	1.82212	0.00412	0.00214	0.00321	0.00823	1.04966	0.98342	0.09299	0.98597	0.00863	0.00431	0.49945
168	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.16688	0.93629	0.16942	0.93883	0.00424	0.00424	1.00000
169	0.05901	0.27410	0.13705	0.45190	0.09156	0.18311	2.21289	1.93938	0.19095	0.08990	0.13713	0.37934	0.05987	1.08405	0.42929	1.16431	0.36990	0.20311	0.54909
170	0.02275	0.17020	0.08510	0.50954	0.06017	0.12034	1.96257	2.09110	0.13064	0.06011	0.08877	0.24378	0.72355	1.11590	0.94520	1.01781	0.22981	0.12606	0.54853
171	0.00499	0.07975	0.03987	0.32951	0.02232	0.04464	3.03485	2.06385	0.06299	0.00590	0.04024	0.11173	2.32225	1.13246	2.33626	1.02929	0.12204	0.05211	0.42664
172	0.00746	0.09745	0.04872	0.52060	0.03457	0.06915	1.92086	1.95072	0.07565	0.02417	0.04936	0.13385	2.40122	1.03565	2.52988	1.06749	0.13831	0.06865	0.49637
173	0.00055	0.02643	0.01321	0.37149	0.00745	0.01491	2.69189	5.75194	0.03345	0.00527	0.01729	0.05866	2.60122	1.03947	2.60377	1.09679	0.05958	0.01172	0.19670
174	0.02036	0.16100	0.08050	0.56262	0.05980	0.11960	1.77739	2.04922	0.12331	0.03909	0.08386	0.22825	0.46496	1.07896	0.65986	1.19488	0.23185	0.11180	0.48220
175	0.00759	0.09830	0.04915	0.32407	0.02741	0.05483	3.08577	3.63738	0.10668	0.00663	0.05702	0.18368	1.97576	1.19233	2.13244	1.09934	0.21013	0.04599	0.21885
176	0.00006	0.00838	0.00419	0.91360	0.00340	0.00680	1.09458	2.26893	0.00540	0.00311	0.00433	0.01072	1.10189	1.06877	1.10953	1.06367	0.01008	0.00697	0.69176
177	0.00006	0.00898	0.00449	0.86419	0.00357	0.00713	1.15715	2.33960	0.00593	0.00319	0.00464	0.01174	0.90954	1.08660	0.91845	1.08151	0.01154	0.00698	0.60479
178	0.01634	0.14424	0.07212	0.51029	0.05094	0.10189	1.95968	1.82027	0.09807	0.04521	0.07351	0.19243	0.97960	1.10061	1.05730	1.27513	0.19032	0.10932	0.57442
179	0.02691	0.18510	0.09255	0.77534	0.08092	0.16184	1.28976	1.62433	0.11904	0.06841	0.09374	0.23425	1.40379	1.10698	1.42672	1.33883	0.22887	0.14970	0.65407
180	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	0.23566	0.95285	0.23821	0.95667	0.00519	0.00477	0.91906
181	0.00566	0.08487	0.04243	0.66257	0.03394	0.06788	1.50926	2.06702	0.06302	0.02621	0.04393	0.11990	2.50568	1.12737	2.60377	1.19361	0.11446	0.06292	0.54974
182	0.00477	0.07790	0.03895	0.70471	0.03212	0.06424	1.41903	1.95094	0.06061	0.02762	0.04030	0.10689	0.00510	1.23182	0.03694	1.13119	0.10197	0.05951	0.58357
183	0.00596	0.08711	0.04356	0.22620	0.02014	0.04027	4.42096	3.14488	0.07765	0.00220	0.04412	0.15017	2.28785	1.15921	2.42670	1.21271	0.15566	0.04875	0.31322
184	0.01263	0.12682	0.06341	0.83330	0.05731	0.11462	1.20005	1.38796	0.07588	0.04871	0.06391	0.14793	1.51462	1.21017	1.65984	1.18978	0.15111	0.10643	0.70430
185	0.00212	0.05193	0.02596	0.43155	0.01648	0.03295	2.31725	2.72767	0.04189	0.00800	0.02599	0.08285	2.43817	1.21144	2.49422	1.15284	0.08448	0.03192	0.37780
186	0.02990	0.19512	0.09756	0.77017	0.08503	0.17007	1.29841	1.69139	0.13415	0.07056	0.09968	0.25203	0.61273	1.37195	0.76177	1.17068	0.24995	0.15231	0.60935
187	0.00006	0.00898	0.00449	0.86419	0.00357	0.00713	1.15715	2.33960	0.00593	0.00319	0.00464	0.01174	1.18724	1.16686	1.19233	1.15794	0.01154	0.00698	0.60479
188	0.00018	0.01535	0.00767	0.74106	0.00603	0.01206	1.34943	2.17438	0.01086	0.00451	0.00797	0.02066	0.44458	1.17450	0.45859	1.16176	0.02048	0.01150	0.56150
189	0.00946	0.10975	0.05488	0.60714	0.04218	0.08437	1.64706	2.63128	0.08998	0.03535	0.05864	0.17564	0.32483	1.30825	0.44712	1.18469	0.16115	0.07475	0.46386
190	0.00005	0.00761	0.00380	0.72698	0.00324	0.00649	1.37555	1.71806	0.00498	0.00255	0.00396	0.00997	2.12480	1.18469	2.13244	1.18851	0.01021	0.00567	0.55527
191	0.01321	0.12971	0.06485	0.47303	0.04401	0.08803	2.11403	3.23330	0.12220	0.02939	0.07393	0.23014	2.14263	1.20762	2.36683	1.25348	0.23135	0.07272	0.31433
192	0.00007	0.00932	0.00466	0.89796	0.00379	0.00758	1.11363	2.10354	0.00580	0.00382	0.00477	0.01161	2.12862	1.19361	2.13499	1.20125	0.01062	0.00817	0.76890
193	0.03566	0.21309	0.10654	0.29573	0.05737	0.11475	3.38143	3.08078	0.22609	0.02446	0.11553	0.37035	0.83947	1.57704	0.95922	1.22800	0.40794	0.11131	0.27285
194	0.00116	0.03846	0.01923	0.52403	0.01334	0.02667	1.90829	2.16140	0.03000	0.00603	0.01961	0.05417	1.74391	1.24838	1.78850	1.27641	0.05567	0.02657	0.47736
195	0.00043	0.02349	0.01174	0.72381	0.00941	0.01883	1.38157	2.39676	0.01902	0.00820	0.01231	0.03426	1.71334	1.24074	1.73372	1.26622	0.03212	0.01718	0.53478
196	0.01294	0.12836	0.06418	0.27561	0.03312	0.06624	3.62828	4.10366	0.14652	0.00379	0.06995	0.25559	1.83690	1.49551	1.94391	1.26494	0.27401	0.06013	0.21945
197	0.00009	0.01095	0.00547	0.79411	0.00427	0.00854	1.25928	2.66947	0.00802	0.00366	0.00579	0.01567	1.80761	1.27386	1.81398	1.26112	0.01550	0.00773	0.49904
198	0.00707	0.09489	0.04744	0.26049	0.02364	0.04728	3.83894	2.31197	0.07651	0.00453	0.04587	0.14086	2.04964	1.30188	2.16938	1.37322	0.15450	0.05828	0.37722
199	0.00287	0.06044	0.03022	0.52570	0.02134	0.04268	1.90223	2.72877	0.05418	0.01481	0.03262	0.09724	1.22163	1.35666	1.24966	1.26494	0.10102	0.03616	0.35796
200	0.00308	0.06264	0.03132	0.80344	0.02751	0.05501	1.24465	1.60115	0.04133	0.02265	0.03201	0.07766	1.12991	1.27768	1.17832	1.33628	0.07891	0.04972	0.63007
201	0.00528	0.08201	0.04100	0.57456	0.03052	0.06103	1.74045	1.94744	0.05873	0.03050	0.04189	0.11237	2.49294	1.39360	2.50059	1.28278	0.10083	0.06670	0.66144
202	0.00587	0.08647	0.04324	0.51012	0.03029	0.06058	1.96034	1.87554	0.06133	0.02748	0.04473	0.11616	1.54774	1.39870	1.58213	1.28915	0.12248	0.06105	0.49844
203	0.00345	0.06632	0.03316	0.50817	0.02306	0.04612	1.96785	2.27821	0.05032	0.01861	0.03533	0.09764	1.28023	1.30571	1.33118	1.38723	0.09704	0.04533	0.4671



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-6 19.74μm

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸点X	絶対最大長軸点Y	絶対最大長軸点X	絶対最大長軸点Y	楕円長軸	楕円短軸	楕円長短比
205	0.00096	0.03497	0.01749	0.76342	0.01470	0.02940	1.30990	1.62303	0.02231	0.01266	0.01783	0.04287	2.31715	1.32864	2.35154	1.30571	0.04366	0.02802	0.64171
206	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	2.35154	1.34392	2.35537	1.34902	0.00712	0.00580	0.81492
207	0.00008	0.01006	0.00503	0.84346	0.00401	0.00803	1.18560	2.39102	0.00695	0.00358	0.00524	0.01352	1.08915	1.35411	1.09552	1.36430	0.01298	0.00780	0.60090
208	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	2.31078	1.35666	2.31460	1.35921	0.00519	0.00477	0.91906
209	0.00008	0.01037	0.00518	0.94376	0.00447	0.00894	1.05960	2.12671	0.00711	0.00436	0.00540	0.01342	2.36046	1.35666	2.36810	1.36558	0.01229	0.00874	0.71154
210	0.00052	0.02583	0.01292	0.40349	0.00765	0.01529	2.47840	3.90976	0.02505	0.00417	0.01473	0.04760	2.34390	1.35793	2.36556	1.39870	0.04970	0.01343	0.27019
211	0.00657	0.09148	0.04574	0.63149	0.03576	0.07152	1.58356	1.87998	0.06433	0.02804	0.04656	0.12339	2.18085	1.37322	2.26492	1.46112	0.12037	0.06952	0.57751
212	0.00005	0.00813	0.00407	0.98664	0.00346	0.00692	1.01354	2.40633	0.00537	0.00371	0.00424	0.01081	2.32225	1.37959	2.32861	1.37322	0.00908	0.00728	0.80107
213	0.00010	0.01141	0.00570	0.48783	0.00340	0.00681	2.04988	4.13188	0.01082	0.00261	0.00636	0.01982	2.30441	1.38723	2.31715	1.37449	0.02011	0.00647	0.32195
214	0.00011	0.01177	0.00588	0.57131	0.00388	0.00776	1.75036	3.72679	0.01013	0.00293	0.00662	0.01982	1.13246	1.39488	1.14520	1.38214	0.02008	0.00689	0.34332
215	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	2.31078	1.38978	2.31333	1.39233	0.00424	0.00424	1.00000
216	0.00581	0.08603	0.04301	0.64723	0.03404	0.06807	1.54505	1.70984	0.05610	0.02897	0.04337	0.11064	0.66495	1.40125	0.68024	1.50952	0.10760	0.06878	0.63922
217	0.00008	0.00996	0.00498	0.86648	0.00404	0.00808	1.15410	2.42377	0.00682	0.00380	0.00519	0.01352	1.05093	1.41144	1.05730	1.40125	0.01280	0.00775	0.60525
218	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	2.35027	1.40252	2.35409	1.40761	0.00712	0.00580	0.81492
219	0.00279	0.05965	0.02982	0.60179	0.02256	0.04512	1.66172	2.31282	0.04615	0.01718	0.03083	0.08846	2.37193	1.46366	2.44581	1.41781	0.08505	0.04183	0.49186
220	0.00062	0.02806	0.01403	0.81758	0.01211	0.02421	1.22313	1.49667	0.01816	0.01082	0.01424	0.03276	0.07516	1.43691	0.10318	1.42290	0.03335	0.02360	0.70774
221	0.00012	0.01220	0.00610	0.61881	0.00423	0.00846	1.61600	3.54591	0.01050	0.00271	0.00677	0.02026	1.04839	1.43054	1.06495	1.42163	0.02072	0.00718	0.34648
222	0.00036	0.02142	0.01071	0.60655	0.00777	0.01553	1.64867	2.80046	0.01749	0.00675	0.01146	0.03337	1.18978	1.42672	1.21781	1.44201	0.03206	0.01431	0.44639
223	0.00446	0.07536	0.03768	0.58226	0.02816	0.05632	1.71745	2.47265	0.06019	0.01618	0.04066	0.11606	1.15412	1.42927	1.17195	1.54264	0.12684	0.04478	0.35302
224	0.01521	0.13918	0.06959	0.46294	0.04678	0.09355	2.16012	2.03325	0.09931	0.03863	0.07266	0.19606	1.86875	1.48914	2.06110	1.51971	0.19702	0.09832	0.49906
225	0.00124	0.03968	0.01984	0.44830	0.01273	0.02545	2.23064	2.40174	0.03099	0.01239	0.02104	0.05892	2.32734	1.46876	2.37320	1.50315	0.05922	0.02659	0.44892
226	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	2.22400	1.45877	2.22802	1.46112	0.00519	0.00477	0.91906
227	0.00004	0.00704	0.00352	0.75398	0.00306	0.00611	1.32629	1.60221	0.00446	0.00269	0.00366	0.00891	0.21146	1.46112	0.21783	1.46494	0.00870	0.00570	0.65504
228	0.00068	0.02932	0.01466	0.82433	0.01274	0.02547	1.21311	1.56590	0.01841	0.00913	0.01485	0.03511	1.65602	1.46112	1.68149	1.48277	0.03490	0.02463	0.70553
229	0.01807	0.15168	0.07584	0.48238	0.05210	0.10419	2.07304	2.93299	0.13075	0.03948	0.08216	0.25692	0.03312	1.54010	0.28280	1.48532	0.26017	0.08843	0.33989
230	0.01903	0.15565	0.07783	0.50904	0.05495	0.10990	1.96449	1.82941	0.10906	0.04505	0.07872	0.20835	1.47513	1.48277	1.67512	1.53627	0.21269	0.11391	0.53556
231	0.01317	0.12952	0.06476	0.53944	0.04699	0.09397	1.85377	2.80644	0.11759	0.03959	0.07009	0.21434	1.69041	1.64200	1.81907	1.47258	0.19462	0.08619	0.44290
232	0.00213	0.05203	0.02601	0.61108	0.01977	0.03954	1.63643	2.58100	0.04261	0.01405	0.02809	0.08125	0.43948	1.47513	0.50063	1.52608	0.08080	0.03350	0.41456
233	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.37961	1.47640	0.38471	1.48150	0.00757	0.00683	0.90212
234	0.00011	0.01203	0.00601	0.87115	0.00502	0.01004	1.14791	2.25092	0.00809	0.00474	0.00623	0.01614	1.25220	1.52099	1.26367	1.52990	0.01474	0.00981	0.66530
235	0.01164	0.12176	0.06088	0.43137	0.03940	0.07881	2.31819	2.36575	0.09293	0.03330	0.06401	0.18455	0.62674	1.53118	0.67387	1.70825	0.19380	0.07651	0.39477
236	0.00930	0.10884	0.05442	0.49604	0.03776	0.07552	2.01596	1.81507	0.07669	0.02641	0.05425	0.14446	2.04200	1.67385	2.07130	1.53373	0.13752	0.08615	0.62646
237	0.00170	0.04655	0.02328	0.33502	0.01288	0.02576	2.98490	3.51424	0.04570	0.00544	0.02614	0.08345	2.58848	1.62927	2.59867	1.54774	0.09715	0.02231	0.22963
238	0.00045	0.02384	0.01192	0.79589	0.01006	0.02011	1.25645	1.91225	0.01639	0.00830	0.01233	0.03118	1.02800	1.55920	1.05603	1.54901	0.03152	0.01803	0.57189
239	0.01269	0.12711	0.06356	0.53126	0.04575	0.09150	1.88233	1.40800	0.07547	0.04082	0.06260	0.14895	2.33753	1.68022	2.41396	1.55411	0.14958	0.10802	0.72123
240	0.00162	0.04543	0.02272	0.57975	0.01671	0.03342	1.72489	2.95891	0.03861	0.01127	0.02467	0.07550	1.87385	1.55283	1.94646	1.56812	0.07559	0.02731	0.36124
241	0.00299	0.06172	0.03086	0.53508	0.02201	0.04402	1.86889	2.30044	0.04877	0.01989	0.03262	0.09127	1.39233	1.61780	1.47640	1.58595	0.08860	0.04300	0.48530
242	0.01032	0.11463	0.05732	0.48560	0.03935	0.07869	2.05933	2.58459	0.09867	0.01837	0.06034	0.18155	0.02038	1.55666	0.19363	1.60634	0.19172	0.06854	0.35751
243	0.00009	0.01046	0.00523	0.91175	0.00439	0.00879	1.09679	2.12671	0.00673	0.00429	0.00538	0.01342	2.11843	1.55920	2.12607	1.56812	0.01192	0.00919	0.77055
244	0.01076	0.11704	0.05852	0.44780	0.03861	0.07723	2.23316	4.06721	0.12634	0.02302	0.07040	0.23275	0.26624	1.56557	0.47515	1.66493	0.23745	0.05769	0.24295
245	0.00077	0.03123	0.01561	0.61610	0.01170	0.02340	1.62312	3.07219	0.02803	0.00863	0.01724	0.05224	1.91461	1.62035	1.95028	1.58468	0.05042	0.01934	0.38356
246	0.01225	0.12487	0.06244	0.36460	0.03712	0.07424	2.74274	2.33969	0.10100	0.03156	0.06323	0.18807	1.17705	1.76047	1.27004	1.59869	0.17648	0.08836	0.50066
247	0.00100	0.03570	0.01785	0.56906	0.01291	0.02582	1.75727	3.16675	0.03316	0.00768	0.01983	0.06091	1.60379	1.63436	1.65474	1.60379	0.05927	0.02151	0.36292
248	0.00059	0.02735	0.01367	0.82271	0.01181	0.02361	1.21550	1.75024	0.01861	0.00956	0.01402	0.03444	1.02164	1.60124	1.04839	1.62035	0.03451	0.02167	0.62812
249	0.00455	0.07609	0.03804	0.57065	0.02816	0.05631	1.75240	1.88123	0.05374	0.02559	0.03889	0.10224	1.92480	1.65220	2.02416	1.63436	0.10300	0.05620	0.54565
250	0.00556	0.08417	0.04209	0.73668	0.03554	0.07107	1.35744	1.66639	0.05654	0.03292	0.04285	0.10689	0.02675	1.62799	0.05860	1.72863	0.10580	0.06697	0.63296
251	0.01460	0.13634	0.06817	0.51214	0.04821	0.09642	1.95261	1.56682	0.09559	0.03113	0.06901	0.16864	0.14777	1.79614	0.20637	1.63946	0.17690	0.10508	0.59402
252	0.01799	0.15133	0.07566	0.70332	0.06287	0.12574	1.42183	1.44103	0.09197	0.06110	0.07628	0.17998	2.09295	1.74264	2.25983	1.67895	0.17168	0.13339	0.77695
253	0.01473	0.13695	0.06847	0.48394	0.04705	0.09411	2.06636	2.70886	0.12199	0.04031	0.07409	0.22921	1.27259	1.66366	1.48277	1.75156	0.20958	0.08948	0.42696
254	0.00437	0.07461	0.03730	0.45225	0.02452	0.04905	2.21116	2.70968	0.06412	0.01283	0.03900	0.12006	2.46747	1.67385	2.56300	1.74391	0.12185	0.04568	0.37



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-6 19.74m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長始点X	絶対最大長始点Y	絶対最大長終点X	絶対最大長終点Y	楕円長軸	楕円短軸	楕円長短比
256	0.00098	0.03541	0.01771	0.60336	0.01318	0.02636	1.65738	3.22071	0.03281	0.01008	0.01965	0.06091	1.87894	1.69678	1.92990	1.72735	0.05711	0.02196	0.38451
257	0.01584	0.14200	0.07100	0.25382	0.03521	0.07041	3.93984	1.90173	0.10472	0.02087	0.06723	0.19274	0.26624	1.72863	0.42292	1.83818	0.19298	0.10448	0.54141
258	0.01172	0.12218	0.06109	0.26995	0.03118	0.06235	3.70437	2.97758	0.10968	0.03045	0.06808	0.20709	0.50445	1.73117	0.59744	1.91461	0.22031	0.06776	0.30757
259	0.00618	0.08868	0.04434	0.44736	0.02908	0.05816	2.23534	3.40231	0.08423	0.01982	0.05016	0.16040	1.97830	1.72735	2.12225	1.79487	0.15334	0.05128	0.33444
260	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	2.45473	1.72863	2.45727	1.73117	0.00424	0.00424	1.00000
261	0.00006	0.00909	0.00455	0.95328	0.00384	0.00769	1.04901	2.17366	0.00580	0.00382	0.00467	0.01161	0.61527	1.75538	0.62292	1.76175	0.01007	0.00821	0.81492
262	0.00064	0.02853	0.01427	0.63602	0.01081	0.02163	1.57229	2.89905	0.02549	0.00741	0.01564	0.04618	1.97193	1.76557	1.99869	1.80124	0.04621	0.01762	0.38129
263	0.00262	0.05775	0.02887	0.40765	0.01785	0.03570	2.45310	4.62088	0.06691	0.00754	0.03465	0.12019	2.56810	1.76939	2.60377	1.88276	0.11664	0.02859	0.24512
264	0.00863	0.10480	0.05240	0.63131	0.04105	0.08210	1.58402	1.68591	0.07522	0.03460	0.05340	0.13417	1.84327	1.84837	1.97193	1.81525	0.13463	0.08158	0.60599
265	0.00126	0.04007	0.02003	0.66592	0.01575	0.03151	1.50168	2.15082	0.03133	0.01161	0.02118	0.05662	2.27002	1.77576	2.32352	1.78977	0.05707	0.02813	0.49286
266	0.01060	0.11620	0.05810	0.47963	0.03967	0.07934	2.08496	2.01562	0.09226	0.02437	0.06007	0.16264	2.43689	1.81652	2.52479	1.95155	0.16406	0.08230	0.50162
267	0.00254	0.05686	0.02843	0.41666	0.01780	0.03559	2.40001	3.36524	0.05513	0.01404	0.03273	0.10115	0.18853	1.82162	0.25222	1.89805	0.09180	0.03522	0.38371
268	0.00344	0.06620	0.03310	0.55500	0.02408	0.04816	1.80179	2.28611	0.05222	0.01428	0.03356	0.09774	1.21017	1.91461	1.23564	1.82162	0.09801	0.04471	0.45618
269	0.00940	0.10937	0.05469	0.70474	0.04533	0.09067	1.41895	1.48713	0.07169	0.03858	0.05536	0.13171	0.71846	1.94518	0.76686	1.82417	0.12996	0.09205	0.70833
270	0.01031	0.11457	0.05728	0.65585	0.04580	0.09159	1.52474	1.77391	0.08090	0.03865	0.05900	0.15063	1.95283	1.95155	2.09168	1.89678	0.15540	0.08447	0.54353
271	0.00980	0.11169	0.05585	0.28576	0.02927	0.05854	3.49948	1.99377	0.09045	0.02221	0.05459	0.15463	0.93374	1.87257	1.06495	1.95155	0.15668	0.07962	0.50821
272	0.00004	0.00704	0.00352	0.75398	0.00306	0.00611	1.32629	1.63625	0.00447	0.00308	0.00364	0.00901	0.32866	1.87639	0.33375	1.88149	0.00704	0.00704	1.00000
273	0.00514	0.08090	0.04045	0.36867	0.02397	0.04793	2.71248	5.38431	0.10123	0.01489	0.05131	0.18317	1.72990	1.95155	1.90824	1.91588	0.18155	0.03605	0.19859
274	0.00206	0.05124	0.02562	0.66475	0.02029	0.04059	1.50432	2.40051	0.04069	0.01505	0.02719	0.07713	1.11590	1.94136	1.19106	1.95155	0.07687	0.03416	0.44444
275	0.00002	0.00557	0.00278	0.73631	0.00239	0.00478	1.35812	1.63625	0.00356	0.00191	0.00294	0.00712	1.91461	1.91716	1.91971	1.91971	0.00707	0.00438	0.61930
276	0.00143	0.04274	0.02137	0.29888	0.01109	0.02218	3.34582	4.62456	0.04670	0.00478	0.02470	0.08724	0.50954	1.95155	0.59489	1.94136	0.08766	0.02084	0.23770
277	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.59999	1.94646	0.60254	1.94900	0.00424	0.00424	1.00000



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-16 26.4m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸点X	絶対最大長軸点Y	絶対最大長軸点X	絶対最大長軸点Y	楕円長軸	楕円短軸	楕円長短比
1	0.00014	0.01333	0.00666	0.73665	0.00512	0.01025	1.35749	2.30286	0.01052	0.00489	0.00701	0.01812	0.16051	0.00382	0.17452	0.01274	0.01734	0.01025	0.59079
2	0.00146	0.04305	0.02152	0.33367	0.01183	0.02367	2.99699	5.35691	0.05147	0.00755	0.02742	0.09483	0.41910	0.00382	0.51209	0.01401	0.10453	0.01773	0.16962
3	0.03418	0.20860	0.10430	0.16158	0.04133	0.08266	6.18870	3.21774	0.19401	0.01763	0.11188	0.36887	0.39107	0.17707	0.72865	0.03185	0.40660	0.10702	0.26321
4	0.00134	0.04129	0.02064	0.51848	0.01426	0.02852	1.92873	3.48414	0.04355	0.01083	0.02379	0.07394	0.75158	0.00382	0.82164	0.02293	0.07016	0.02429	0.34623
5	0.00002	0.00498	0.00249	0.58905	0.00191	0.00382	1.69765	2.45044	0.00390	0.00180	0.00279	0.00779	0.94775	0.00382	0.95412	0.00510	0.00860	0.00288	0.33550
6	0.00016	0.01445	0.00722	0.70454	0.00546	0.01093	1.41937	2.62634	0.01114	0.00411	0.00772	0.02109	1.28660	0.00382	1.30571	0.00892	0.02240	0.00932	0.41589
7	0.00678	0.09292	0.04646	0.44251	0.03031	0.06061	2.25982	2.80206	0.08021	0.02037	0.05085	0.15253	1.45220	0.00382	1.52481	0.13630	0.15628	0.05525	0.35353
8	0.00088	0.03356	0.01678	0.53494	0.01167	0.02333	1.86935	3.16919	0.03173	0.00914	0.01867	0.05679	1.72863	0.00382	1.78340	0.01274	0.05517	0.02041	0.36998
9	0.00723	0.09596	0.04798	0.45614	0.03181	0.06361	2.19230	2.69465	0.07909	0.01463	0.05104	0.15461	1.80506	0.15159	1.84582	0.00382	0.17406	0.05291	0.30395
10	0.00089	0.03359	0.01679	0.31971	0.00890	0.01780	3.12788	3.60454	0.03118	0.00649	0.01867	0.05976	2.22416	0.06115	2.23562	0.00382	0.06201	0.01819	0.29341
11	0.00784	0.09990	0.04995	0.65110	0.03970	0.07940	1.53585	2.11314	0.07338	0.03215	0.05179	0.14304	2.31205	0.03949	2.45345	0.02930	0.13926	0.07166	0.51460
12	0.00299	0.06171	0.03085	0.58498	0.02300	0.04599	1.70945	1.55207	0.03911	0.01996	0.03073	0.07491	0.35923	0.08025	0.39107	0.01401	0.07807	0.04877	0.62470
13	0.00303	0.06214	0.03107	0.42140	0.01958	0.03916	2.37306	4.10249	0.06262	0.01331	0.03635	0.12219	1.18851	0.02038	1.22673	0.13503	0.12553	0.03076	0.24505
14	0.00288	0.06052	0.03026	0.28362	0.01552	0.03105	3.52586	2.99460	0.05124	0.00426	0.03269	0.10089	0.38725	0.09427	0.47260	0.04331	0.11670	0.03139	0.26898
15	0.01123	0.11958	0.05979	0.29447	0.03185	0.06369	3.39593	1.62504	0.08083	0.03216	0.05833	0.14963	0.06751	0.11720	0.19363	0.03949	0.15657	0.09133	0.58330
16	0.02083	0.16285	0.08143	0.25734	0.04070	0.08140	3.88595	1.89812	0.12620	0.03721	0.08510	0.22106	1.80378	0.18471	1.97576	0.04841	0.25139	0.10549	0.41964
17	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.89807	0.04713	0.90317	0.05223	0.00757	0.00683	0.90212
18	0.00009	0.01046	0.00523	0.93176	0.00447	0.00894	1.07324	2.10109	0.00716	0.00445	0.00541	0.01342	2.21779	0.07388	2.22671	0.06624	0.01229	0.00891	0.72484
19	0.00145	0.04303	0.02151	0.63550	0.01658	0.03315	1.57357	2.78033	0.03823	0.01361	0.02323	0.06934	1.66876	0.08790	1.71716	0.13503	0.06699	0.02763	0.41252
20	0.01533	0.13972	0.06986	0.72794	0.05900	0.11800	1.37374	1.50202	0.08673	0.04618	0.07038	0.16950	1.31462	0.10191	1.45093	0.20000	0.17348	0.11252	0.64861
21	0.00223	0.05330	0.02665	0.62917	0.02053	0.04107	1.58941	2.18988	0.04109	0.01366	0.02771	0.07662	1.61398	0.08917	1.64710	0.15668	0.07729	0.03676	0.47557
22	0.00163	0.04555	0.02277	0.54123	0.01615	0.03231	1.84766	2.69557	0.03722	0.01486	0.02389	0.07210	2.03817	0.13758	2.10059	0.10446	0.06673	0.03109	0.46589
23	0.00772	0.09913	0.04956	0.54415	0.03596	0.07191	1.83772	1.89747	0.07087	0.03022	0.05051	0.13428	0.19745	0.12611	0.29554	0.21528	0.13580	0.07236	0.53285
24	0.00348	0.06653	0.03326	0.34227	0.01887	0.03774	2.92163	2.38593	0.05063	0.01289	0.03355	0.09964	2.16556	0.16051	2.25855	0.12866	0.10583	0.04182	0.39515
25	0.00250	0.05643	0.02821	0.58466	0.02097	0.04195	1.71039	2.13747	0.04501	0.01919	0.02951	0.08020	2.10442	0.12993	2.16301	0.18216	0.07537	0.04224	0.56045
26	0.00165	0.04586	0.02293	0.65912	0.01802	0.03604	1.51718	2.36965	0.03543	0.01406	0.02388	0.06834	2.41906	0.17961	2.45727	0.12484	0.06345	0.03315	0.52245
27	0.01393	0.13316	0.06658	0.61497	0.05161	0.10322	1.62610	1.95328	0.09360	0.04198	0.06839	0.18396	0.71209	0.12866	0.73756	0.30955	0.18704	0.09480	0.50686
28	0.00071	0.03001	0.01501	0.52363	0.01026	0.02051	1.90973	1.87343	0.02163	0.00618	0.01512	0.03880	0.31974	0.14777	0.35541	0.13630	0.04344	0.02074	0.47731
29	0.00011	0.01159	0.00579	0.92794	0.00499	0.00998	1.07765	1.91158	0.00755	0.00489	0.00594	0.01433	1.69551	0.15286	1.70315	0.16305	0.01307	0.01027	0.78565
30	0.00155	0.04442	0.02221	0.58543	0.01641	0.03283	1.70815	2.50785	0.03770	0.00897	0.02371	0.06795	0.12229	0.19872	0.17834	0.16305	0.07066	0.02792	0.39519
31	0.00246	0.05600	0.02800	0.56597	0.02046	0.04091	1.76689	1.64665	0.03820	0.01348	0.02789	0.06979	0.04204	0.20509	0.10318	0.17452	0.07254	0.04324	0.59610
32	0.00035	0.02113	0.01056	0.69482	0.00821	0.01643	1.43921	2.13661	0.01494	0.00602	0.01099	0.02881	2.38084	0.18471	2.40759	0.17834	0.02968	0.01504	0.50656
33	0.00003	0.00843	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	0.00382	0.17197	0.00764	0.17707	0.00712	0.00580	0.81492
34	0.01657	0.14523	0.07262	0.26903	0.03707	0.07413	3.71707	4.21995	0.14865	0.01253	0.08113	0.29360	1.47258	0.24968	1.76302	0.21656	0.30704	0.06870	0.22374
35	0.00092	0.03414	0.01707	0.66694	0.01335	0.02670	1.49939	2.23155	0.02916	0.01094	0.01820	0.04885	0.00382	0.23439	0.01019	0.18726	0.04890	0.02383	0.48733
36	0.00430	0.07399	0.03700	0.69893	0.03035	0.06069	1.43075	1.86819	0.05643	0.02730	0.03817	0.09923	1.17322	0.20382	1.23692	0.27770	0.09736	0.05624	0.57763
37	0.00006	0.00909	0.00455	0.84003	0.00355	0.00709	1.19043	2.29927	0.00587	0.00328	0.00470	0.01174	1.33628	0.20764	1.34520	0.21273	0.01180	0.00701	0.59392
38	0.00761	0.09844	0.04922	0.38829	0.03007	0.06014	2.57537	1.59321	0.06863	0.01350	0.04816	0.12182	0.09936	0.29044	0.21019	0.24331	0.13450	0.07204	0.53563
39	0.00143	0.04262	0.02131	0.80259	0.01851	0.03702	1.24597	1.47056	0.02762	0.01738	0.02160	0.05011	1.78850	0.26241	1.83436	0.24585	0.04948	0.03670	0.74177
40	0.00033	0.02048	0.01024	0.83033	0.00874	0.01747	1.20435	1.72217	0.01264	0.00733	0.01042	0.02517	0.02802	0.24585	0.04331	0.22802	0.02419	0.01734	0.71695
41	0.00373	0.06889	0.03445	0.71185	0.02845	0.05691	1.40480	1.70977	0.04503	0.02018	0.03513	0.08820	0.28662	0.27515	0.36687	0.24203	0.09241	0.05136	0.55575
42	0.01349	0.13106	0.06553	0.22910	0.03076	0.06153	4.36487	3.29802	0.12221	0.00446	0.06578	0.23345	1.66239	0.45095	1.77321	0.24713	0.25027	0.06863	0.27423
43	0.04365	0.23575	0.11788	0.57501	0.08878	0.17756	1.73911	2.00403	0.17578	0.07769	0.12084	0.33148	0.39235	0.25477	0.59871	0.51209	0.31409	0.17695	0.56338
44	0.00312	0.06305	0.03152	0.64276	0.02469	0.04937	1.55579	1.84694	0.04599	0.02136	0.03260	0.08369	1.99104	0.32993	2.06747	0.29936	0.08621	0.04611	0.53487
45	0.00070	0.02977	0.01489	0.48711	0.00980	0.01959	2.05294	3.84834	0.02840	0.00593	0.01736	0.05508	0.04713	0.32101	0.06751	0.27133	0.05684	0.01580	0.27439
46	0.00592	0.08679	0.04340	0.47412	0.02928	0.05857	2.10919	2.45664	0.06958	0.01277	0.04536	0.13331	2.03308	0.36687	2.12862	0.27643	0.14289	0.05272	0.36893
47	0.00466	0.07700	0.03850	0.35838	0.02245	0.04490	2.79032	2.75467	0.07043	0.00866	0.04026	0.12448	2.39486	0.35923	2.50568	0.30573	0.13569	0.04370	0.32205
48	0.00313	0.06308	0.03154	0.62717	0.02438	0.04877	1.59446	2.04266	0.04669	0.01899	0.03218	0.08801	2.16811	0.37706	2.20632	0.29936	0.08766	0.04539	0.51782
49	0.00012	0.01245	0.00622	0.85719	0.00515	0.01031	1.16660	2.15409	0.00853	0.00480	0.00643	0.01634	2.25855	0.30445	2.27129	0.31210	0.01550	0.01000	0.64494
50	0.02224	0.16829	0.08415	0.58264	0.06362	0.12723	1.71632	2.47915	0.13294	0.04584	0.08959	0.26245	1.11335	0.56177	1.15794	0.30445	0.26729	0.10596	0.39643
51	0.00085	0.03297	0.01648	0.															



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-16 26.4m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾角X	絶対最大長傾角Y	絶対最大長傾角Z	楕円長軸	楕円短軸	楕円長短比	
52	0.00208	0.05149	0.02574	0.70488	0.02102	0.04203	1.41869	1.55564	0.03253	0.01668	0.02615	0.06244	2.57956	0.38471	2.60377	0.32866	0.06427	0.04125	0.64179
53	0.00099	0.03553	0.01777	0.50013	0.01197	0.02394	1.99949	3.08494	0.03240	0.00269	0.01877	0.05945	1.19743	0.37451	1.23819	0.33375	0.06036	0.02091	0.34646
54	0.00195	0.04983	0.02492	0.73489	0.02078	0.04156	1.36076	1.73354	0.03287	0.01706	0.02541	0.06383	2.12098	0.40381	2.14263	0.34522	0.06455	0.03847	0.59606
55	0.00247	0.05611	0.02806	0.37655	0.01662	0.03324	2.65572	4.35445	0.06151	0.00845	0.03275	1.11305	2.48912	0.38216	2.57574	0.45222	0.11230	0.02804	0.24970
56	0.00417	0.07283	0.03641	0.70945	0.03007	0.06014	1.40955	1.82709	0.04997	0.02922	0.03710	0.09651	1.22236	0.40891	1.31207	0.43439	0.09061	0.05853	0.46600
57	0.01085	0.11754	0.05877	0.22385	0.02720	0.05441	4.46733	1.93837	0.08697	0.00461	0.05320	0.16010	0.69680	0.39107	0.77578	0.52865	0.17600	0.07850	0.44604
58	0.00237	0.05492	0.02746	0.77388	0.02355	0.04710	1.29220	1.64460	0.03559	0.02110	0.02797	0.06866	1.55029	0.40381	1.61143	0.43184	0.06639	0.04544	0.68437
59	0.00045	0.02384	0.01192	0.63672	0.00889	0.01779	1.57055	2.09671	0.01783	0.00638	0.01211	0.03228	0.00382	0.41783	0.01911	0.39107	0.03175	0.01789	0.56349
60	0.00040	0.02250	0.01125	0.79226	0.00942	0.01885	1.26221	1.56467	0.01364	0.00877	0.01135	0.02649	0.07639	0.38980	2.08658	0.41273	0.02564	0.01974	0.77017
61	0.00345	0.06632	0.03316	0.35980	0.01929	0.03858	2.77933	2.44092	0.05715	0.01936	0.03641	0.10048	2.43562	0.49553	2.49167	0.41400	0.10723	0.04102	0.38254
62	0.01086	0.11760	0.05880	0.57475	0.04397	0.08794	1.73989	2.00736	0.08486	0.03738	0.06084	0.16435	0.30190	0.44840	0.45349	0.50827	0.16228	0.08523	0.52517
63	0.00250	0.05644	0.02822	0.58051	0.02090	0.04180	1.72262	2.33312	0.04256	0.01626	0.02940	0.08381	0.203690	0.45222	2.11715	0.43311	0.08354	0.03814	0.45649
64	0.00318	0.06364	0.03182	0.65938	0.02523	0.05047	1.51657	1.59510	0.04175	0.02144	0.03238	0.07849	2.35027	0.42420	2.39995	0.48279	0.08189	0.04945	0.60382
65	0.00012	0.01261	0.00631	0.71816	0.00474	0.00947	1.39245	2.42556	0.00928	0.00400	0.00651	0.01741	0.66750	0.43821	0.68151	0.43056	0.01760	0.00904	0.51382
66	0.00269	0.05856	0.02928	0.58610	0.02182	0.04364	1.70620	2.23724	0.04424	0.01114	0.03004	0.08527	1.21515	0.51591	2.16556	0.43311	0.08668	0.03957	0.45644
67	0.00055	0.02650	0.01325	0.76750	0.01100	0.02199	1.30293	1.70277	0.01665	0.00945	0.01334	0.03276	2.27639	0.47133	2.29040	0.44330	0.03147	0.02233	0.70951
68	0.00905	0.10732	0.05366	0.52792	0.03839	0.07679	1.89424	1.69619	0.07027	0.03473	0.05351	0.13764	0.03822	0.52356	0.16560	0.47515	0.13362	0.08620	0.64511
69	0.00058	0.02720	0.01360	0.61790	0.01011	0.02023	1.61838	2.96338	0.02416	0.00748	0.01496	0.04430	0.24458	0.49044	0.26624	0.45349	0.04555	0.01624	0.35650
70	0.00123	0.03965	0.01983	0.76773	0.01677	0.03354	1.30254	1.95248	0.02693	0.01376	0.02026	0.05348	1.97193	0.45986	2.01652	0.48661	0.05014	0.03136	0.62546
71	0.00081	0.03217	0.01609	0.59656	0.01183	0.02366	1.67627	2.30420	0.02479	0.00992	0.01669	0.04649	2.50441	0.49553	2.54390	0.47388	0.04541	0.02279	0.50188
72	0.00005	0.00800	0.00400	0.65899	0.00264	0.00528	1.51747	3.25262	0.00649	0.00226	0.00423	0.01174	2.59867	0.48024	2.60377	0.47133	0.01145	0.00560	0.48891
73	0.01893	0.15526	0.07763	0.56294	0.05765	0.11529	1.77638	1.93424	0.11996	0.05389	0.08045	0.21371	1.25985	0.62292	1.41781	0.48152	0.19758	0.12200	0.61747
74	0.00029	0.01923	0.00962	0.64547	0.00711	0.01421	1.54927	2.48728	0.01426	0.00538	0.00986	0.02790	0.28152	0.50572	0.30190	0.48916	0.02641	0.01401	0.53041
75	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	1.43564	0.48661	1.44201	0.49171	0.00889	0.00697	0.78403
76	0.00080	0.03198	0.01599	0.51092	0.01082	0.02164	1.95724	1.63455	0.02013	0.00576	0.01559	0.03870	0.30318	0.49681	0.32866	0.52356	0.04031	0.02537	0.62955
77	0.00390	0.07048	0.03524	0.54401	0.02538	0.05076	1.83821	2.42530	0.05736	0.01508	0.03616	0.10718	0.88915	0.49681	0.96176	0.57324	0.10792	0.04602	0.42648
78	0.00031	0.01987	0.00993	0.64127	0.00736	0.01472	1.55940	2.61193	0.01628	0.00433	0.01040	0.02970	2.56173	0.52228	2.57956	0.50063	0.02976	0.01326	0.44465
79	0.00642	0.09042	0.04521	0.26922	0.02286	0.04573	3.71439	2.75252	0.09439	0.00967	0.04661	0.14622	1.42290	0.52101	1.49169	0.64839	0.14452	0.05657	0.39144
80	0.00071	0.03012	0.01506	0.66769	0.01170	0.02340	1.49769	2.59327	0.02592	0.00922	0.01600	0.04612	2.59230	0.52356	2.60377	0.56687	0.04397	0.02063	0.46916
81	0.00483	0.07839	0.03919	0.42411	0.02492	0.04983	2.35786	2.33615	0.06364	0.00414	0.03888	0.11696	0.01274	0.53757	0.04968	0.64712	0.11889	0.05168	0.43470
82	0.01238	0.12556	0.06278	0.64461	0.04981	0.09963	1.55132	1.41863	0.08071	0.04183	0.06326	0.14780	2.14518	0.58598	2.28148	0.63948	0.15429	0.10219	0.66228
83	0.00898	0.10692	0.05346	0.65662	0.04273	0.08547	1.52295	1.78123	0.07114	0.03784	0.05414	0.14077	0.56432	0.68406	0.61145	0.55285	0.13575	0.08421	0.62032
84	0.00770	0.09902	0.04951	0.67911	0.04020	0.08040	1.47252	1.53023	0.06413	0.03215	0.05031	0.12069	1.85856	0.66241	1.94391	0.57961	0.12598	0.07784	0.61788
85	0.00351	0.06685	0.03343	0.51081	0.02329	0.04658	1.95767	1.65942	0.04470	0.01311	0.03288	0.08396	0.41400	0.64330	0.44203	0.56559	0.09109	0.04906	0.53855
86	0.00273	0.05892	0.02946	0.61636	0.02254	0.04508	1.62243	1.53781	0.03819	0.01711	0.02930	0.07120	0.08535	0.61782	0.13758	0.57196	0.07272	0.04773	0.65633
87	0.00109	0.03723	0.01862	0.40114	0.01123	0.02246	2.49292	4.30955	0.04007	0.00408	0.02303	0.07361	0.71209	0.64457	0.75030	0.58343	0.08463	0.01638	0.19357
88	0.00016	0.01416	0.00708	0.47441	0.00427	0.00855	2.10790	3.84118	0.01261	0.00334	0.00801	0.02432	2.00888	0.60763	2.01652	0.62929	0.02692	0.00744	0.27648
89	0.00045	0.02388	0.01194	0.58714	0.00857	0.01713	1.70317	3.15341	0.02152	0.00603	0.01311	0.03971	2.36173	0.62674	2.39488	0.60763	0.04044	0.01410	0.34871
90	0.00667	0.09215	0.04608	0.68407	0.03751	0.07502	1.46185	1.66318	0.06109	0.03312	0.04697	0.11697	0.80890	0.61145	0.83183	0.72483	0.11285	0.07525	0.66676
91	0.00182	0.04819	0.02410	0.75656	0.02036	0.04072	1.32177	1.48272	0.02887	0.01605	0.02432	0.05701	0.47005	0.61527	0.48024	0.67005	0.05881	0.03949	0.67139
92	0.01406	0.13382	0.06691	0.36564	0.03986	0.07972	2.73491	1.96581	0.10006	0.01993	0.06609	0.18484	0.65986	0.62164	0.70317	0.79998	0.19445	0.09209	0.47358
93	0.00358	0.06756	0.03378	0.52611	0.02390	0.04780	1.90075	2.10642	0.04994	0.01526	0.03486	0.09565	2.05346	0.62164	2.08021	0.71209	0.10075	0.04530	0.44967
94	0.00938	0.10929	0.05464	0.65545	0.04366	0.08732	1.52568	2.16135	0.08267	0.03642	0.05725	0.15857	1.48914	0.71336	1.64200	0.67642	0.15253	0.07830	0.51336
95	0.01942	0.15724	0.07862	0.19747	0.03434	0.06868	5.06416	2.29220	0.12827	0.01547	0.08047	0.23399	1.38086	0.62801	1.43309	0.85476	0.30291	0.08163	0.26947
96	0.00208	0.05143	0.02571	0.56875	0.01879	0.03758	1.75823	1.99434	0.03735	0.01435	0.02672	0.07036	0.19108	0.69807	0.19745	0.62929	0.07229	0.03658	0.50600
97	0.00105	0.03659	0.01830	0.59318	0.01348	0.02696	1.68584	2.47531	0.03082	0.01091	0.01955	0.05507	1.23437	0.68151	1.24711	0.62929	0.05592	0.02394	0.42813
98	0.01267	0.12701	0.06351	0.52511	0.04542	0.09083	1.90438	2.35145	0.09904	0.04031	0.06613	0.19222	2.31842	0.75540	2.46874	0.63820	0.18229	0.08850	0.48548
99	0.00009	0.01095	0.00547	0.93763	0.00472	0.00944	1.06652	1.92321	0.00710	0.00428	0.00561	0.01352	0.08917	0.64330	0.09936	0.64967	0.01264	0.00948	0.74983
100	0.00042	0.02309	0.01154	0.48285	0.00742	0.01485	2.07104	2.97348	0.02003	0.00492	0.01253	0.03685	0.53502	0.64457	0.54394	0.67897	0.04016	0.01327	0.33051
101	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	2.01907	0.64585	2.02416	0.65094	0.00757	0.00683	0.90212
102	0.00004	0.00719	0.00359	0.															



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-16 26.4m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾点X	絶対最大長傾点Y	絶対最大長傾点X	絶対最大長傾点Y	楕円長軸	楕円短軸	楕円長短比
103	0.01172	0.12214	0.06107	0.70450	0.05066	0.10132	1.41945	1.91206	0.08443	0.04556	0.06263	0.16692	1.77958	0.80763	1.82926	0.64967	0.15806	0.09439	0.59721
104	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.23694	0.65476	0.24203	0.65986	0.00757	0.00683	0.90212
105	0.00013	0.01278	0.00639	0.54191	0.00410	0.00820	1.84531	3.72337	0.01081	0.00279	0.00720	0.02148	2.00251	0.67387	2.00888	0.65476	0.02383	0.00685	0.28741
106	0.00297	0.06152	0.03076	0.56818	0.02260	0.04520	1.75999	2.04099	0.04396	0.01036	0.03088	0.08567	0.41910	0.66878	0.48789	0.71718	0.09261	0.04087	0.44130
107	0.00038	0.02213	0.01106	0.74628	0.00897	0.01793	1.33998	2.06915	0.01588	0.00750	0.01139	0.02986	2.30059	0.67260	2.32352	0.68916	0.02919	0.01677	0.57453
108	0.00877	0.10568	0.05284	0.58317	0.03975	0.07949	1.71477	1.96800	0.08094	0.02698	0.05498	0.14603	1.10061	0.76559	1.22163	0.68661	0.15040	0.07425	0.49372
109	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.25605	0.68024	0.26114	0.68534	0.00757	0.00683	0.90212
110	0.00007	0.00964	0.00482	0.79574	0.00368	0.00737	1.25669	2.40974	0.00641	0.00318	0.00503	0.01282	2.01015	0.68024	2.01525	0.69043	0.01326	0.00701	0.52868
111	0.00249	0.05633	0.02817	0.67087	0.02247	0.04493	1.49061	1.47044	0.03547	0.02268	0.02838	0.06652	2.19613	0.68534	2.21015	0.74903	0.06610	0.04801	0.72639
112	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.26496	0.68661	0.27006	0.69171	0.00757	0.00683	0.90212
113	0.00085	0.03284	0.01642	0.42489	0.01010	0.02020	2.35353	1.98873	0.02388	0.00384	0.01577	0.04371	1.92990	0.68916	1.94518	0.72865	0.04550	0.02371	0.52104
114	0.00089	0.03359	0.01679	0.73182	0.01377	0.02754	1.36646	1.61204	0.02134	0.01308	0.01699	0.04087	2.28912	0.73629	2.29932	0.69807	0.03925	0.02874	0.73235
115	0.00114	0.03811	0.01906	0.39599	0.01139	0.02278	2.52531	5.07156	0.04113	0.00598	0.02403	0.08151	1.00635	0.69935	1.02036	0.77833	0.08861	0.01639	0.18500
116	0.00447	0.07543	0.03772	0.27693	0.01924	0.03849	3.61097	2.98800	0.07074	0.01438	0.04147	0.12643	0.77068	0.70062	0.84457	0.80126	0.12910	0.04408	0.34140
117	0.00019	0.01555	0.00777	0.60495	0.00545	0.01090	1.65303	2.57922	0.01148	0.00231	0.00800	0.02250	2.01270	0.71336	2.02926	0.70062	0.02368	0.01021	0.43111
118	0.00092	0.03414	0.01707	0.31472	0.00898	0.01797	3.17739	2.43565	0.02645	0.00325	0.01734	0.04999	2.54517	0.72100	2.58466	0.74903	0.05760	0.02023	0.35127
119	0.00464	0.07686	0.03843	0.73843	0.03242	0.06483	1.35423	1.42486	0.04570	0.02569	0.03861	0.09006	2.44708	0.78470	2.51078	0.72355	0.08934	0.06612	0.74012
120	0.00028	0.01885	0.00943	0.39518	0.00534	0.01067	2.53051	4.25800	0.01764	0.00190	0.01048	0.03503	0.90062	0.72228	0.91463	0.75285	0.04025	0.00883	0.21938
121	0.00603	0.08759	0.04379	0.58969	0.03303	0.06606	1.69582	1.82430	0.06388	0.02718	0.04435	0.11619	1.56685	0.81145	1.64837	0.73120	0.11297	0.06791	0.60112
122	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	2.02544	0.72228	2.03053	0.72737	0.00757	0.00683	0.90212
123	0.00082	0.03240	0.01620	0.55853	0.01151	0.02303	1.79042	1.82509	0.02187	0.00462	0.01585	0.04163	0.85603	0.72865	0.89425	0.74139	0.04509	0.02328	0.51828
124	0.01324	0.12984	0.06492	0.49311	0.04499	0.08997	2.02793	2.08911	0.09552	0.04502	0.06648	0.18519	0.05987	0.79744	0.24076	0.76432	0.17303	0.09743	0.56306
125	0.00015	0.01386	0.00693	0.71743	0.00527	0.01054	1.39387	2.64761	0.01045	0.00397	0.00731	0.02026	1.51080	0.74139	1.52736	0.73247	0.02057	0.00934	0.45410
126	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	2.01907	0.73120	2.02416	0.73629	0.00757	0.00683	0.90212
127	0.01404	0.13369	0.06685	0.22581	0.03117	0.06233	4.42856	3.43503	0.13336	0.00766	0.07075	0.24311	0.41146	0.89680	0.62419	0.78215	0.28332	0.06309	0.22268
128	0.00292	0.06098	0.03049	0.59330	0.02289	0.04578	1.68549	1.78199	0.05114	0.01516	0.03281	0.09914	2.08531	0.74139	2.15792	0.80635	0.10035	0.03706	0.36930
129	0.04370	0.23590	0.11795	0.13643	0.04296	0.08593	7.32972	3.82978	0.25597	0.00715	0.13421	0.45527	2.10951	1.05985	2.50186	0.83183	0.55639	0.10001	0.17976
130	0.00209	0.05165	0.02582	0.58409	0.01914	0.03828	1.71208	2.18617	0.04102	0.01059	0.02687	0.07407	1.66493	0.77451	1.72098	0.82037	0.07719	0.03456	0.44772
131	0.00109	0.03729	0.01864	0.70804	0.01508	0.03015	1.41236	1.97916	0.02564	0.01320	0.01900	0.05041	0.40763	0.81272	0.44330	0.77960	0.04745	0.02930	0.61750
132	0.00028	0.01880	0.00940	0.42234	0.00551	0.01101	2.36776	3.83189	0.01746	0.00524	0.01053	0.03317	2.52479	0.81782	2.53371	0.78724	0.03394	0.01041	0.30671
133	0.00029	0.01912	0.00956	0.82653	0.00810	0.01619	1.20988	1.72087	0.01232	0.00704	0.00969	0.02336	0.02548	0.78979	0.04204	0.80381	0.02273	0.01609	0.70794
134	0.00403	0.07167	0.03583	0.49487	0.02463	0.04927	2.02075	2.64191	0.06322	0.01430	0.03743	0.11384	0.96049	0.89680	0.99106	0.78852	0.11556	0.04445	0.38465
135	0.01753	0.14938	0.07469	0.34597	0.04333	0.08666	2.89046	1.84931	0.10192	0.03071	0.07143	0.20037	1.21144	0.98724	1.23692	0.78979	0.20605	0.10830	0.52560
136	0.00370	0.06868	0.03434	0.32345	0.01894	0.03789	3.09170	3.48093	0.06581	0.00172	0.03528	0.12429	1.06112	0.89425	1.14647	0.80635	0.13363	0.03530	0.26415
137	0.01293	0.12831	0.06415	0.48836	0.04423	0.08846	2.04767	1.91591	0.09524	0.03384	0.06514	0.17521	1.60251	0.95667	1.68277	0.80253	0.17306	0.09513	0.54967
138	0.00412	0.07240	0.03620	0.68778	0.02943	0.05887	1.45395	1.79053	0.04791	0.01953	0.03665	0.09498	1.97321	0.83056	2.06620	0.84202	0.10030	0.05226	0.52106
139	0.00190	0.04923	0.02461	0.66780	0.01952	0.03904	1.49745	1.78065	0.03413	0.01485	0.02495	0.06375	0.67132	0.82546	0.72483	0.85731	0.06409	0.03782	0.59011
140	0.01822	0.15232	0.07616	0.25702	0.03801	0.07602	3.89082	4.03352	0.17326	0.01688	0.08830	0.30116	1.01654	1.11845	1.03437	0.81909	0.33376	0.06951	0.20826
141	0.00651	0.09103	0.04552	0.68585	0.03710	0.07420	1.45805	1.84848	0.06846	0.03175	0.04696	0.12181	0.00382	0.94648	0.03185	0.82928	0.12293	0.06741	0.54836
142	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	2.59995	0.85349	2.60377	0.85858	0.00712	0.00580	0.81492
143	0.00006	0.00909	0.00455	0.95328	0.00384	0.00769	1.04901	2.17366	0.00580	0.00382	0.00467	0.01161	0.62164	0.86240	0.62929	0.85603	0.01007	0.00821	0.81492
144	0.00043	0.02344	0.01172	0.70858	0.00926	0.01853	1.41128	2.28973	0.01832	0.00814	0.01225	0.03331	2.57956	0.87387	2.60377	0.89425	0.03129	0.01757	0.56146
145	0.00184	0.04836	0.02418	0.69531	0.01956	0.03911	1.43821	1.98029	0.03355	0.01522	0.02473	0.06601	0.15414	0.93756	0.16560	0.87387	0.06864	0.03408	0.49646
146	0.00018	0.01508	0.00754	0.85761	0.00638	0.01277	1.16603	1.72714	0.00932	0.00518	0.00766	0.01812	2.50186	0.88915	2.51078	0.87514	0.01834	0.01240	0.67603
147	0.00100	0.03568	0.01784	0.69537	0.01428	0.02855	1.43809	2.10516	0.02676	0.01103	0.01834	0.04968	2.01015	0.92482	2.02544	0.87896	0.04821	0.02640	0.54770
148	0.00035	0.02113	0.01056	0.44677	0.00645	0.01291	2.23827	2.39862	0.01673	0.00427	0.01107	0.02991	2.52606	0.90189	2.55154	0.88915	0.03142	0.01420	0.45194
149	0.00544	0.08320	0.04160	0.62359	0.03226	0.06452	1.60362	2.03023	0.06148	0.02609	0.04300	0.11641	0.76304	0.89934	0.82291	0.99743	0.11642	0.05945	0.51070
150	0.00434	0.07431	0.03716	0.53193	0.02651	0.05301	1.87995	3.14246	0.06765	0.01607	0.04079	0.12885	0.51846	0.96559	0.62801	0.90062	0.13127	0.04207	0.32049
151	0.00037	0.02161	0.01080	0.51035	0.00712	0.01425	1.95943	3.26880	0.01836	0.00511	0.01182	0.03606	2.24199	0.92482	2.26874	0.90317	0.03414	0.01368	0.40060
152	0.00222	0.05322	0.02661	0.66821	0.02115	0.04230	1.49653	1.59139	0.03363	0.01573	0.02663	0.06528	2.47256	0.94648	2.53498	0.96049	0.06693	0.04232	0.63228
1																			



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-16 26.4m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸X	絶対最大長軸Y	絶対最大長軸Z	絶対最大長軸X'	絶対最大長軸Y'	楕円長軸	楕円短軸	楕円長短比
154	0.00081	0.03214	0.01607	0.17594	0.00614	0.01228	5.68372	3.99882	0.02978	0.00142	0.01710	0.05856	1.11717	0.95794	1.17195	0.97450	0.06272	0.01647	0.26264	
155	0.00111	0.03757	0.01878	0.57582	0.01366	0.02731	1.73667	2.58076	0.02972	0.01053	0.01989	0.05782	0.39999	1.00125	0.42420	0.95030	0.05637	0.02503	0.44405	
156	0.01699	0.14708	0.07354	0.23311	0.03490	0.06980	4.28984	2.53674	0.11802	0.01996	0.07064	0.23025	0.57324	1.08405	0.77196	0.97068	0.24661	0.08772	0.35568	
157	0.00006	0.00909	0.00455	0.92082	0.00375	0.00749	1.08599	2.21050	0.00582	0.00367	0.00467	0.01161	0.15923	0.96686	0.16560	0.97450	0.01039	0.00796	0.76599	
158	0.00019	0.01548	0.00774	0.43598	0.00451	0.00903	2.29366	4.21285	0.01517	0.00389	0.00884	0.02807	1.10316	0.96686	1.11845	0.98851	0.02905	0.00825	0.28401	
159	0.00519	0.08126	0.04063	0.60469	0.03100	0.06200	1.65373	1.76135	0.05885	0.02633	0.04133	0.10581	1.44710	1.03183	1.53245	0.97195	0.10444	0.06322	0.60536	
160	0.00008	0.01027	0.00513	0.39921	0.00265	0.00530	2.50495	4.58395	0.00897	0.00064	0.00549	0.01794	2.25473	0.98215	2.26492	0.99488	0.02013	0.00523	0.25996	
161	0.00024	0.01737	0.00868	0.58292	0.00604	0.01207	1.71550	3.15094	0.01481	0.00450	0.00943	0.02807	1.55156	1.01017	1.56685	0.98851	0.02811	0.01073	0.38183	
162	0.00011	0.01168	0.00584	0.74650	0.00443	0.00887	1.33959	2.32924	0.00830	0.00341	0.00603	0.01567	0.19490	0.99361	0.20764	0.99998	0.01621	0.00841	0.51916	
163	0.00123	0.03952	0.01976	0.71878	0.01616	0.03231	1.39124	2.14813	0.02811	0.01243	0.02046	0.05586	2.26874	1.00253	2.30441	1.04329	0.05588	0.02795	0.50030	
164	0.00527	0.08188	0.04094	0.61653	0.03155	0.06309	1.62198	2.20231	0.06501	0.02327	0.04274	0.11925	0.30318	1.09297	0.40381	1.03183	0.12029	0.05574	0.46337	
165	0.00265	0.05812	0.02906	0.57709	0.02148	0.04296	1.73283	2.96780	0.05222	0.01631	0.03182	0.09741	0.76177	1.10444	0.79744	1.01527	0.09487	0.03561	0.37531	
166	0.01324	0.12984	0.06492	0.43820	0.04237	0.08474	2.28206	2.58386	0.11275	0.03138	0.06931	0.20577	0.40127	1.17450	0.53502	1.02036	0.21123	0.07982	0.37787	
167	0.00789	0.10026	0.05013	0.26639	0.02527	0.05054	3.75386	3.33377	0.09146	0.00093	0.05370	0.17879	0.09172	1.06112	0.25732	1.12482	0.18650	0.05390	0.28898	
168	0.00027	0.01852	0.00926	0.61772	0.00668	0.01337	1.61887	3.09251	0.01531	0.00398	0.00996	0.02991	0.82801	1.05730	0.85349	1.04456	0.03156	0.01087	0.34442	
169	0.00397	0.07109	0.03554	0.74155	0.03002	0.06004	1.34852	1.45568	0.04479	0.02186	0.03564	0.08412	1.34137	1.04329	1.36176	1.12354	0.08759	0.05770	0.65878	
170	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	0.09936	1.04584	0.10573	1.05093	0.00889	0.00697	0.78403	
171	0.00025	0.01790	0.00895	0.77047	0.00726	0.01452	1.29791	1.82012	0.01172	0.00460	0.00908	0.02232	2.51460	1.04584	2.51969	1.06622	0.02363	0.01355	0.57359	
172	0.00499	0.07968	0.03984	0.24712	0.01922	0.03843	4.04661	3.44979	0.07363	0.01503	0.04250	0.14360	1.87257	1.07259	2.00888	1.11335	1.14605	0.04347	0.29766	
173	0.00228	0.05384	0.02692	0.76049	0.02287	0.04574	1.31495	1.44763	0.03447	0.02040	0.02722	0.06311	2.42288	1.11208	2.43817	1.05221	0.06430	0.04508	0.70110	
174	0.01117	0.11927	0.05963	0.29355	0.03171	0.06342	3.40653	2.90622	0.10092	0.00173	0.05695	0.19956	1.14902	1.05858	1.21399	1.24583	0.20116	0.07071	0.35153	
175	0.00503	0.08001	0.04000	0.37105	0.02377	0.04754	2.69505	3.06097	0.08287	0.01269	0.04253	0.13655	1.64710	1.06877	1.77066	1.12354	0.14173	0.04516	0.31864	
176	0.01473	0.13696	0.06848	0.47098	0.04640	0.09279	2.12322	2.07819	0.10710	0.04080	0.07004	0.19491	2.19868	1.07132	2.23690	1.26112	0.19214	0.09763	0.50810	
177	0.00135	0.04154	0.02077	0.46433	0.01354	0.02707	2.15362	2.07737	0.03223	0.00911	0.02062	0.05726	1.54774	1.08278	1.59742	1.10826	0.05823	0.02963	0.50886	
178	0.00328	0.06465	0.03233	0.63969	0.02524	0.05049	1.56325	1.95858	0.04526	0.01682	0.03280	0.08834	0.92227	1.09552	0.97960	1.16049	0.08834	0.04731	0.53558	
179	0.00665	0.09199	0.04600	0.58443	0.03455	0.06910	1.71107	2.48670	0.07787	0.02767	0.05030	0.14254	2.57320	1.25093	2.59103	1.11081	0.14343	0.05900	0.41134	
180	0.00319	0.06368	0.03184	0.49217	0.02173	0.04346	2.03180	2.17082	0.04682	0.01231	0.03221	0.09126	0.77068	1.14902	0.85731	1.12482	0.09832	0.04125	0.41953	
181	0.00038	0.02213	0.01106	0.55733	0.00767	0.01535	1.79426	2.76607	0.01727	0.00400	0.01149	0.03419	0.12611	1.13756	0.15032	1.11590	0.03488	0.01404	0.40254	
182	0.00566	0.08489	0.04245	0.77370	0.03673	0.07347	1.29250	1.66171	0.05397	0.03502	0.04342	0.10767	1.25093	1.19870	1.31717	1.11590	0.10146	0.07103	0.70010	
183	0.00222	0.05311	0.02655	0.33203	0.01471	0.02942	3.01174	3.17474	0.04898	0.01013	0.02867	0.09096	2.33116	1.19106	2.39613	1.12991	0.08962	0.03147	0.35117	
184	0.01172	0.12215	0.06108	0.34930	0.03549	0.07098	2.86288	2.49202	0.09688	0.00215	0.05742	0.18959	2.37193	1.26367	2.51460	1.14138	0.19692	0.07577	0.38480	
185	0.02909	0.19244	0.09622	0.15715	0.03753	0.07507	6.36352	4.05667	0.20825	0.03002	0.10405	0.38142	0.07388	1.37555	0.42292	1.18724	0.40077	0.09241	0.23058	
186	0.00127	0.04027	0.02014	0.81740	0.01761	0.03522	1.22339	1.87520	0.02704	0.01462	0.02050	0.05335	1.42035	1.18087	1.45220	1.14010	0.04975	0.03260	0.65539	
187	0.00179	0.04776	0.02388	0.54271	0.01699	0.03398	1.84259	1.81492	0.03277	0.01353	0.02432	0.06213	1.95410	1.15539	1.99741	1.19743	0.06322	0.03608	0.57067	
188	0.00108	0.03704	0.01852	0.54961	0.01313	0.02625	1.81949	2.41869	0.02858	0.00893	0.01933	0.05508	2.27893	1.15666	2.29932	1.20634	0.05587	0.02456	0.43953	
189	0.00172	0.04678	0.02339	0.66298	0.01844	0.03687	1.50834	1.70289	0.03003	0.01474	0.02374	0.05909	0.65986	1.16940	0.71336	1.19106	0.05932	0.03689	0.62184	
190	0.00032	0.02028	0.01014	0.82326	0.00861	0.01723	1.21468	1.63787	0.01265	0.00691	0.01032	0.02430	1.56048	1.17322	1.57831	1.18724	0.02444	0.01682	0.68822	
191	0.00070	0.02981	0.01490	0.53501	0.01029	0.02058	1.86913	2.72384	0.02565	0.00775	0.01596	0.04643	0.59871	1.18214	0.63948	1.20125	0.04707	0.01887	0.40101	
192	0.03422	0.20875	0.10437	0.11888	0.03539	0.07078	8.41192	3.81235	0.20458	0.00440	0.11751	0.40082	1.44710	1.52863	1.66239	1.19233	0.46387	0.09394	0.20252	
193	0.00221	0.05299	0.02649	0.59003	0.01975	0.03950	1.69482	1.83130	0.03633	0.01940	0.02718	0.06959	0.49171	1.26494	0.50827	1.19870	0.06783	0.04139	0.61020	
194	0.00552	0.08381	0.04191	0.41205	0.02629	0.05259	2.42688	3.44612	0.08311	0.01494	0.04716	0.15208	0.53375	1.20380	0.68279	1.22673	0.15030	0.04674	0.31095	
195	0.01908	0.15584	0.07792	0.14384	0.02896	0.05792	6.95223	2.88391	0.13077	0.03324	0.07953	0.25933	1.02673	1.22927	1.25093	1.35666	0.29020	0.08369	0.28838	
196	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	2.51332	1.20125	2.51842	1.20634	0.00757	0.00683	0.90212	
197	0.00158	0.04488	0.02244	0.39171	0.01345	0.02690	2.55290	3.39527	0.04115	0.00916	0.02469	0.07919	2.28658	1.22163	2.36173	1.24201	0.08328	0.02419	0.29043	
198	0.00108	0.03701	0.01851	0.49223	0.01237	0.02474	2.03157	1.89203	0.02771	0.00881	0.01893	0.04851	2.48530	1.21271	2.51078	1.25220	0.04883	0.02805	0.57443	
199	0.01519	0.13905	0.06952	0.34618	0.04030	0.08060	2.88866	2.56671	0.12384	0.02305	0.07265	0.21948	1.72481	1.21908	1.73754	1.43691	0.20202	0.09571	0.47374	
200	0.00179	0.04769	0.02385	0.43656	0.01515	0.03031	2.29062	3.89650	0.05206	0.01083	0.02862	0.09055	1.77321	1.23437	1.85601	1.26749	0.09622	0.02364	0.24569	
201	0.01491	0.13780	0.06890	0.24391	0.03343	0.06685	4.09990	3.82356	0.14419	0.02635	0.08327	0.26468	2.07639	1.49169	2.11078	1.23055	0.25765	0.07370	0.28606	
202	0.00581	0.08598	0.04299	0.65152	0.03412	0.06824	1.53487	1.51440	0.05693	0.02985	0.04356	0.10403	0.69425	1.33373	0.75285	1.24966	0.10766	0.06867	0.63782	
203	0.00006	0.00838	0.00419	0.98199	0.00356	0.00712	1.01834	2.26195	0.00540	0.00390	0.00431	0.01081	1.35666	1.25348	1.36303	1.24711	0.00883	0.00795	0.90024	



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-16 26.4m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長X	絶対最大長Y	絶対最大長Z	楕円長軸	楕円短軸	楕円長短比	
205	0.00007	0.00920	0.00460	0.92484	0.00382	0.00763	1.08127	2.13803	0.00581	0.00375	0.00472	0.01161	2.26620	1.25603	2.27384	1.24966	0.01034	0.00819	0.79161
206	0.00107	0.03687	0.01844	0.31892	0.00980	0.01960	3.13560	3.33205	0.03244	0.01031	0.01987	0.06335	2.28276	1.25093	2.31588	1.30316	0.05979	0.02274	0.38023
207	0.00347	0.06646	0.03323	0.42814	0.02113	0.04226	2.33571	2.46674	0.05541	0.01613	0.03607	0.10143	2.57065	1.26239	2.59613	1.35921	0.10409	0.04244	0.40768
208	0.00007	0.00964	0.00482	0.86470	0.00387	0.00774	1.15647	2.26600	0.00629	0.00365	0.00498	0.01252	2.32607	1.27386	2.33244	1.28278	0.01185	0.00785	0.66248
209	0.00449	0.07564	0.03782	0.62103	0.02921	0.05841	1.61022	2.76253	0.06574	0.02287	0.04061	0.12319	0.57196	1.38851	0.61655	1.27513	0.11855	0.04826	0.40705
210	0.00065	0.02875	0.01437	0.65456	0.01102	0.02205	1.52774	2.05442	0.02089	0.01062	0.01491	0.03906	1.81525	1.30698	1.84837	1.28915	0.03818	0.02164	0.56680
211	0.00064	0.02850	0.01425	0.37097	0.00807	0.01614	2.69567	2.68043	0.02278	0.00784	0.01473	0.04339	2.32734	1.31844	2.35282	1.28532	0.04219	0.01925	0.45618
212	0.00048	0.02465	0.01232	0.58138	0.00879	0.01759	1.72005	2.48994	0.01907	0.00560	0.01261	0.03640	1.94773	1.31717	1.95920	1.28405	0.03795	0.01601	0.42178
213	0.02654	0.18384	0.09192	0.25847	0.04613	0.09226	3.86890	3.06132	0.16432	0.01081	0.09199	0.31750	0.37706	1.28532	0.39107	1.60124	0.34024	0.09933	0.29194
214	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	1.96811	1.28532	1.97321	1.29042	0.00757	0.00683	0.90212
215	0.00011	0.01159	0.00579	0.84172	0.00471	0.00942	1.18804	2.01530	0.00760	0.00420	0.00597	0.01457	2.08403	1.29042	2.09040	1.30188	0.01463	0.00918	0.62721
216	0.00388	0.07026	0.03513	0.44878	0.02296	0.04591	2.22824	3.78463	0.07349	0.01663	0.04153	0.13333	1.27004	1.39615	1.35029	1.29169	0.13525	0.03650	0.28985
217	0.00034	0.02068	0.01034	0.83810	0.00889	0.01778	1.19317	1.55466	0.01296	0.00848	0.01047	0.02421	0.51337	1.29297	0.52356	1.31335	0.02325	0.01839	0.79118
218	0.00009	0.01066	0.00533	0.60962	0.00355	0.00710	1.64037	3.23113	0.00824	0.00203	0.00559	0.01634	2.06493	1.30571	2.07257	1.29297	0.01713	0.00664	0.38746
219	0.00031	0.01997	0.00998	0.34499	0.00526	0.01051	2.89860	3.47799	0.01748	0.00170	0.01052	0.03337	1.91334	1.32736	1.92862	1.29934	0.03529	0.01130	0.32020
220	0.00014	0.01325	0.00663	0.62600	0.00464	0.00927	1.59744	2.85814	0.00990	0.00228	0.00680	0.01982	2.05473	1.32354	2.06747	1.31080	0.01950	0.00901	0.46177
221	0.00139	0.04210	0.02105	0.28601	0.01065	0.02130	3.49643	2.80068	0.03462	0.00853	0.02244	0.06666	1.85092	1.36048	1.89423	1.31207	0.06744	0.02628	0.38973
222	0.00056	0.02678	0.01339	0.53609	0.00919	0.01838	1.86535	2.41765	0.02154	0.00831	0.01401	0.03903	1.96302	1.34774	1.97830	1.31335	0.03904	0.01836	0.47041
223	0.00014	0.01356	0.00678	0.56465	0.00449	0.00897	1.77102	3.20135	0.01081	0.00255	0.00717	0.02136	2.31588	1.31972	2.32479	1.33755	0.02259	0.00814	0.36048
224	0.00060	0.02769	0.01384	0.73859	0.01131	0.02261	1.35393	2.08817	0.02028	0.00911	0.01433	0.03802	0.01019	1.35666	0.03185	1.32736	0.03664	0.02092	0.57093
225	0.00563	0.08470	0.04235	0.38077	0.02553	0.05106	2.62627	2.63162	0.07503	0.01383	0.04345	0.13422	1.38851	1.34265	1.50570	1.40507	0.13870	0.05172	0.37288
226	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	1.91971	1.33373	1.92480	1.33883	0.00757	0.00683	0.90212
227	0.00893	0.10663	0.05331	0.34530	0.03075	0.06149	2.89606	2.56784	0.08484	0.01944	0.05075	0.16769	2.16811	1.46112	2.27893	1.33755	0.17154	0.06628	0.38637
228	0.00393	0.07071	0.03536	0.31153	0.01913	0.03826	3.20999	3.14836	0.06396	0.01043	0.03807	0.12162	0.61400	1.42545	0.70190	1.34392	0.12900	0.03876	0.30047
229	0.00053	0.02587	0.01294	0.48137	0.00837	0.01673	2.07741	2.69449	0.02201	0.00380	0.01357	0.03959	1.92225	1.34392	1.93881	1.37832	0.04050	0.01653	0.40813
230	0.00255	0.05694	0.02847	0.56483	0.02079	0.04159	1.77046	2.72032	0.04912	0.01650	0.03072	0.09127	2.35154	1.36558	2.43562	1.39742	0.08821	0.03675	0.41665
231	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	1.89295	1.35411	1.89805	1.35921	0.00757	0.00683	0.90212
232	0.00006	0.00850	0.00425	0.88618	0.00338	0.00677	1.28444	2.22355	0.00536	0.00318	0.00439	0.01072	1.96047	1.35921	1.96556	1.36685	0.01034	0.00700	0.67689
233	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	1.90569	1.36176	1.91079	1.36685	0.00757	0.00683	0.90212
234	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	1.95028	1.36176	1.95537	1.36685	0.00757	0.00683	0.90212
235	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	1.83818	1.36430	1.84327	1.36940	0.00757	0.00683	0.90212
236	0.00148	0.04338	0.02169	0.29401	0.01115	0.02231	3.40119	2.12939	0.03509	0.01231	0.02244	0.06003	2.59103	1.42290	2.60377	1.36558	0.06373	0.02954	0.46349
237	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	1.89168	1.36685	1.89678	1.37195	0.00757	0.00683	0.90212
238	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	1.84710	1.37067	1.85219	1.37577	0.00757	0.00683	0.90212
239	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	1.87003	1.37195	1.87639	1.37704	0.00889	0.00697	0.78403
240	0.01205	0.12387	0.06193	0.49101	0.04279	0.08558	2.03662	2.03084	0.09259	0.04063	0.06294	0.17405	0.11210	1.37832	0.15668	1.54519	0.16533	0.09280	0.56129
241	0.00586	0.08640	0.04320	0.53994	0.03114	0.06228	1.85206	2.77990	0.07819	0.02563	0.04721	0.14131	1.89295	1.44838	2.01397	1.37832	0.13469	0.05542	0.41149
242	0.00853	0.10419	0.05209	0.25724	0.02582	0.05163	3.88736	2.52120	0.08600	0.00576	0.05100	0.16164	0.93756	1.39742	1.02164	1.53373	0.17743	0.06118	0.34482
243	0.00421	0.07322	0.03661	0.52102	0.02581	0.05162	1.91930	2.35074	0.05639	0.02130	0.03789	0.10965	1.20762	1.39870	1.27386	1.48405	0.10326	0.05192	0.50280
244	0.02163	0.16596	0.08298	0.43666	0.05423	0.10845	2.29011	2.47799	0.13538	0.02689	0.08736	0.25835	2.43307	1.63564	2.54644	1.40507	0.26560	0.10370	0.39044
245	0.00066	0.02896	0.01448	0.52477	0.00989	0.01977	1.90561	2.94151	0.02580	0.00704	0.01559	0.04681	2.28021	1.45729	2.31078	1.42417	0.04815	0.01742	0.36175
246	0.00108	0.03701	0.01851	0.51672	0.01272	0.02544	1.93530	2.57215	0.03053	0.00814	0.02005	0.05675	0.00382	1.44328	0.05478	1.42163	0.05817	0.02355	0.40482
247	0.00201	0.05064	0.02532	0.61453	0.01924	0.03848	1.62727	2.77418	0.04173	0.01419	0.02750	0.08177	1.66621	1.42927	1.70315	1.50661	0.08021	0.03197	0.39855
248	0.00492	0.07914	0.03957	0.37133	0.02350	0.04701	2.69303	1.59209	0.05073	0.01784	0.03865	0.09734	1.97830	1.50698	2.04964	1.44328	0.10728	0.05837	0.54410
249	0.00153	0.04409	0.02205	0.56696	0.01600	0.03201	1.76379	2.05323	0.03291	0.01109	0.02280	0.06091	1.15029	1.46749	1.18087	1.51844	0.06341	0.03066	0.48357
250	0.00318	0.06365	0.03183	0.66641	0.02540	0.05081	1.50057	1.69499	0.04188	0.02086	0.03279	0.08103	0.82164	1.54901	0.83947	1.47131	0.08415	0.04815	0.57212
251	0.00034	0.02073	0.01037	0.58490	0.00733	0.01467	1.70968	3.19119	0.01818	0.00511	0.01122	0.03426	1.21017	1.47768	1.23055	1.50315	0.03390	0.01268	0.37405
252	0.00022	0.01658	0.00829	0.63963	0.00603	0.01206	1.56340	2.48586	0.01218	0.00312	0.00857	0.02377	1.14010	1.48277	1.15157	1.50188	0.02455	0.01120	0.45609
253	0.00014	0.01333	0.00666	0.35876	0.00339	0.00678	2.78735	4.98691	0.01271	0.00202	0.00768	0.02527	1.33500	1.50825	1.34902	1.48914	0.02759	0.00644	0.23347
254	0.00150	0.04374	0.02187	0.35434	0.01241	0.02482	2.82216	2.38099	0.03310	0.01124	0.02249	0.06434	1.81015	1.51971	1.87130	1.50443	0.06651	0.02877	0.43251
255	0.00127																		



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-16 26.4m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸点X	絶対最大長軸点Y	絶対最大長軸点X	絶対最大長軸点Y	楕円長軸	楕円短軸	楕円長短比
256	0.00006	0.00850	0.00425	0.95089	0.00354	0.00708	1.05165	2.21759	0.00538	0.00379	0.00436	0.01081	1.13501	1.51717	1.14138	1.51080	0.00916	0.00789	0.86128
257	0.00011	0.01194	0.00597	0.97330	0.00533	0.01066	1.02743	1.75933	0.00720	0.00551	0.00613	0.01433	1.14775	1.52226	1.15794	1.51462	0.01320	0.01080	0.81881
258	0.02010	0.15996	0.07998	0.62024	0.06237	0.12475	1.61229	2.07032	0.12110	0.05045	0.08347	0.22792	1.30061	1.52226	1.34137	1.74519	0.22113	0.11571	0.52325
259	0.01137	0.12030	0.06015	0.62673	0.04703	0.09405	1.59558	1.55341	0.07821	0.04687	0.06100	0.14807	1.16431	1.66621	1.21526	1.52863	0.14608	0.09908	0.67823
260	0.00556	0.08412	0.04206	0.36494	0.02485	0.04970	2.74016	4.94250	0.09873	0.01108	0.05314	0.18290	1.56048	1.67640	1.68404	1.54392	0.20522	0.03448	1.6802
261	0.00455	0.07615	0.03808	0.59560	0.02880	0.05760	1.67898	2.54264	0.06678	0.02132	0.04080	0.11902	1.95537	1.55156	2.03308	1.63946	0.11523	0.05033	0.43678
262	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	1.72098	1.54392	1.72608	1.55029	0.00889	0.00697	0.78403
263	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	1.71207	1.55283	1.71844	1.55793	0.00889	0.00697	0.78403
264	0.01122	0.11955	0.05977	0.24689	0.02910	0.05820	4.05031	3.00697	0.11519	0.00940	0.06467	0.20312	1.78595	1.56175	1.90442	1.72481	0.25017	0.05713	0.22835
265	0.00011	0.01168	0.00584	0.89683	0.00493	0.00986	1.11503	1.95772	0.00760	0.00443	0.00597	0.01457	1.94009	1.56557	1.94646	1.55411	0.01415	0.00964	0.68089
266	0.00213	0.05208	0.02604	0.23748	0.01208	0.02416	4.21088	3.64772	0.05190	0.00209	0.02760	0.09468	2.33881	1.55793	2.39995	1.62799	0.10188	0.02663	0.26137
267	0.00300	0.01960	0.00980	0.67459	0.00744	0.01489	1.48237	2.44522	0.01512	0.00688	0.01031	0.02834	0.84075	1.60506	0.86622	1.61398	0.02842	0.01352	0.47569
268	0.03480	0.21051	0.10525	0.35563	0.06216	0.12433	2.81193	1.95436	0.16627	0.05978	0.10627	0.29145	0.15923	1.82671	0.35031	1.60888	0.28683	0.15450	0.53865
269	0.01811	0.15187	0.07593	0.74485	0.06492	0.12985	1.34255	1.33117	0.09048	0.06267	0.07617	0.17359	0.02548	1.76047	0.11974	1.61653	0.17337	0.13303	0.76735
270	0.00129	0.04050	0.02025	0.54044	0.01428	0.02856	1.85034	1.77566	0.02881	0.01131	0.02055	0.05177	2.30314	1.64837	2.35282	1.63946	0.05422	0.03026	0.55811
271	0.03109	0.19896	0.09948	0.31801	0.05550	0.11100	3.14454	1.93073	0.15681	0.02535	0.09692	0.27351	1.53118	1.70697	1.77449	1.77449	0.28021	0.14127	0.50415
272	0.00663	0.09189	0.04595	0.59810	0.03492	0.06985	1.67197	1.35902	0.05707	0.03323	0.04557	0.10529	0.81654	1.63946	0.89934	1.70188	0.10546	0.08007	0.75924
273	0.00087	0.03322	0.01661	0.35647	0.00932	0.01864	2.80528	2.64309	0.02653	0.00462	0.01762	0.05077	2.47129	1.65984	2.51969	1.64965	0.05219	0.02114	0.40502
274	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.42547	1.66876	0.43056	1.67385	0.00757	0.00683	0.90212
275	0.00928	0.10870	0.05435	0.49113	0.03748	0.07496	2.03614	2.52328	0.08836	0.03078	0.05808	0.16991	2.25473	1.66876	2.26747	1.83690	0.16244	0.07274	0.44781
276	0.00297	0.06151	0.03075	0.54442	0.02209	0.04418	1.83683	1.67657	0.04031	0.01847	0.03113	0.07752	1.08788	1.70697	1.15029	1.75028	0.07953	0.04757	0.59807
277	0.00043	0.02335	0.01168	0.68413	0.00909	0.01819	1.46171	2.75557	0.01887	0.00599	0.01248	0.03650	2.44071	1.71334	2.47001	1.69423	0.03598	0.01516	0.42136
278	0.00007	0.00920	0.00460	0.92484	0.00382	0.00763	1.08127	2.13803	0.00581	0.00375	0.00472	0.01161	1.44710	1.69551	1.45347	1.70315	0.01034	0.00819	0.79161
279	0.00008	0.00985	0.00493	0.89248	0.00405	0.00809	1.12048	2.13834	0.00629	0.00381	0.00506	0.01252	0.42547	1.70570	0.43184	1.69678	0.01173	0.00828	0.70594
280	0.00404	0.07171	0.03586	0.42581	0.02279	0.04559	2.34844	2.86132	0.06237	0.01459	0.03777	0.11817	1.16431	1.71461	1.25220	1.79105	0.11931	0.04310	0.36125
281	0.00065	0.02868	0.01434	0.66472	0.01109	0.02219	1.50439	2.49993	0.02373	0.00865	0.01525	0.04303	2.59485	1.71461	2.60377	1.75538	0.04271	0.01926	0.45088
282	0.00008	0.01037	0.00518	0.78366	0.00397	0.00795	1.27606	2.54877	0.00720	0.00308	0.00535	0.01433	0.44458	1.73882	0.45222	1.72863	0.01371	0.00784	0.57182
283	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.42547	1.66876	0.43056	1.67385	0.00757	0.00683	0.90212
284	0.00006	0.00909	0.00455	0.92082	0.00375	0.00749	1.08599	2.21050	0.00582	0.00367	0.00467	0.01161	1.11845	1.76684	1.12609	1.76047	0.01039	0.00796	0.76599
285	0.00194	0.04975	0.02488	0.67895	0.01990	0.03981	1.47286	1.90625	0.03542	0.01733	0.02569	0.06670	1.40889	1.76557	1.41653	1.83054	0.06429	0.03850	0.59881
286	0.01898	0.15546	0.07773	0.45480	0.05181	0.10361	2.19876	1.74786	0.12090	0.06020	0.08109	0.20312	1.85092	1.78850	1.96939	1.95155	0.19641	0.12304	0.62646
287	0.00300	0.06182	0.03091	0.30080	0.01636	0.03273	3.32444	4.85616	0.07144	0.00379	0.03875	0.13150	1.45984	1.89423	1.52354	1.78086	0.15182	0.02518	0.16584
288	0.00206	0.05116	0.02558	0.29825	0.01336	0.02672	3.35284	5.03421	0.06592	0.00605	0.03263	0.10977	0.59362	1.80506	0.70062	1.82289	0.11377	0.02301	0.20224
289	0.00042	0.02300	0.01150	0.40410	0.00673	0.01346	2.47462	4.93700	0.02523	0.00362	0.01407	0.04705	0.71846	1.83181	0.73629	1.78977	0.05037	0.01050	0.20847
290	0.00301	0.06189	0.03095	0.52087	0.02174	0.04347	1.91985	2.61924	0.04974	0.01772	0.03217	0.09748	0.75412	1.81652	0.77323	1.91079	0.09058	0.04229	0.46691
291	0.00519	0.08130	0.04065	0.24944	0.01970	0.03940	4.00897	4.25119	0.08488	0.00991	0.04854	0.16265	0.83310	1.82034	0.97832	1.89041	0.18533	0.03566	0.19243
292	0.00791	0.10036	0.05018	0.39642	0.03099	0.06198	2.52256	2.52572	0.08249	0.01313	0.05195	0.15645	2.11715	1.90697	2.26365	1.85601	0.16714	0.06026	0.36054
293	0.00228	0.05384	0.02692	0.44606	0.01738	0.03476	2.24187	1.94938	0.03735	0.00843	0.02617	0.07267	2.29804	1.87130	2.35537	1.82926	0.07391	0.03922	0.53072
294	0.00529	0.08203	0.04102	0.58928	0.03089	0.06178	1.69699	2.05852	0.06262	0.02072	0.04181	0.11547	2.34645	1.94518	2.39231	1.84073	0.10747	0.06261	0.58260
295	0.00069	0.02956	0.01478	0.67698	0.01157	0.02313	1.47715	2.18979	0.02189	0.00957	0.01533	0.04160	1.77831	1.85092	1.81015	1.87512	0.03979	0.02196	0.55199
296	0.00341	0.06589	0.03294	0.46183	0.02177	0.04354	2.16532	2.35538	0.05152	0.02151	0.03462	0.09833	1.62672	1.95155	1.67895	1.87003	0.09269	0.04683	0.50530
297	0.01341	0.13066	0.06533	0.50290	0.04570	0.09141	1.98848	2.77262	0.11753	0.03509	0.07220	0.21462	0.46878	1.95155	0.67387	1.89295	0.21403	0.07977	0.37269
298	0.00258	0.05735	0.02868	0.44154	0.01846	0.03691	2.26480	1.74799	0.04074	0.00586	0.02878	0.07344	1.12482	1.94264	1.16813	1.88531	0.08738	0.03764	0.43075
299	0.00281	0.05982	0.02991	0.57341	0.02204	0.04408	1.74395	2.40638	0.05247	0.02023	0.03141	0.09030	2.00378	1.95155	2.08403	1.91334	0.08551	0.04185	0.48937
300	0.00140	0.04220	0.02110	0.62238	0.01604	0.03207	1.60673	1.55942	0.02717	0.01317	0.02120	0.05077	1.19361	1.93627	1.24201	1.92608	0.05172	0.03443	0.66575
301	0.00091	0.03402	0.01701	0.65187	0.01311	0.02622	1.53404	2.15850	0.02629	0.01186	0.01774	0.04771	1.39105	1.95155	1.42417	1.91971	0.04540	0.02548	0.56131
302	0.00069	0.02960	0.01480	0.21709	0.00629	0.01257	4.60646	8.57395	0.04062	0.00481	0.02153	0.07902	1.24583	1.94900	1.32354	1.95155	0.08236	0.01064	0.12914



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-25 23.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸X	絶対最大長軸Y	絶対最大短軸X	絶対最大短軸Y	楕円長軸	楕円短軸	楕円長短比
1	0.00033	0.02058	0.01029	0.75653	0.00839	0.01677	1.32182	2.24042	0.01517	0.00635	0.01073	0.02887	0.20000	0.00764	0.22165	0.02420	0.02694	0.01572	0.58359
2	0.00427	0.07374	0.03687	0.69440	0.03016	0.06033	1.44009	2.09756	0.05746	0.02328	0.03850	0.10485	0.37324	0.00764	0.38216	0.11083	0.10245	0.05308	0.51811
3	0.00489	0.07890	0.03945	0.60792	0.03017	0.06034	1.64494	1.95063	0.06530	0.02125	0.04152	0.10809	0.52738	0.08280	0.60254	0.00764	0.11371	0.05475	0.48147
4	0.00005	0.00826	0.00413	0.45570	0.00222	0.00445	2.19444	6.32059	0.00837	0.00176	0.00484	0.01656	0.76432	0.00764	0.77960	0.00764	0.01665	0.00410	0.24606
5	0.00442	0.07502	0.03751	0.54055	0.02700	0.05400	1.84998	2.62659	0.06044	0.02260	0.03966	0.11902	1.14520	0.06624	1.24711	0.00764	0.10937	0.05146	0.47052
6	0.00045	0.02384	0.01192	0.59269	0.00857	0.01714	1.68722	3.22891	0.02212	0.00622	0.01319	0.04001	1.40761	0.00764	1.44456	0.01911	0.04114	0.01381	0.33576
7	0.00013	0.01294	0.00647	0.61758	0.00448	0.00897	1.61923	2.74472	0.01015	0.00359	0.00685	0.01890	1.59105	0.00764	1.60124	0.02166	0.01927	0.00869	0.45077
8	0.00020	0.01588	0.00794	0.77334	0.00640	0.01280	1.29310	2.17953	0.01251	0.00557	0.00830	0.02148	1.62035	0.01401	1.63946	0.00764	0.02047	0.01231	0.60128
9	0.00030	0.01950	0.00975	0.46929	0.00610	0.01220	2.13089	4.25573	0.02278	0.00560	0.01189	0.03674	1.88404	0.02293	1.91588	0.00764	0.03425	0.01110	0.32406
10	0.00192	0.04940	0.02470	0.31394	0.01327	0.02654	3.18534	2.93337	0.04446	0.00456	0.02614	0.08113	2.12607	0.00892	2.20123	0.03567	0.08987	0.02715	0.30212
11	0.00199	0.05033	0.02516	0.72273	0.02083	0.04166	1.38364	1.98393	0.03794	0.01767	0.02602	0.06901	2.28530	0.00764	2.34263	0.04331	0.06331	0.04001	0.63203
12	0.00014	0.01325	0.00663	0.25059	0.00275	0.00550	3.99052	8.52212	0.01712	0.00197	0.00939	0.03209	2.43052	0.00764	2.46110	0.01146	0.03707	0.00474	0.12780
13	0.00201	0.05064	0.02532	0.42583	0.01596	0.03191	2.34834	3.64270	0.05297	0.01400	0.02916	0.09334	2.45218	0.06369	2.52479	0.00764	0.09389	0.02731	0.29087
14	0.00165	0.04588	0.02294	0.82750	0.02030	0.04060	1.20845	1.77506	0.03091	0.01865	0.02342	0.05946	1.72608	0.01783	1.76939	0.05605	0.05607	0.03755	0.66959
15	0.00009	0.01085	0.00543	0.63933	0.00377	0.00754	1.56414	3.27972	0.00901	0.00338	0.00597	0.01707	1.55920	0.01656	1.56303	0.03185	0.01730	0.00681	0.39351
16	0.00675	0.09271	0.04635	0.34886	0.02881	0.05361	2.86645	3.72051	0.09159	0.00693	0.05158	0.17509	1.29934	0.03057	1.43054	0.14395	0.19524	0.04402	0.22547
17	0.00000	0.00144	0.00072	0.78540	0.00064	0.00127	1.27324	1.57080	0.00064	0.00064	0.00064	0.00180	0.01529	0.02293	0.01529	0.02293	0.00102	0.00102	1.00000
18	0.00116	0.03835	0.01918	0.71670	0.01567	0.03133	1.39529	1.80755	0.02673	0.01222	0.01977	0.04976	0.69680	0.05732	0.73502	0.02802	0.05083	0.02894	0.56939
19	0.00214	0.05214	0.02607	0.65674	0.02055	0.04111	1.52267	2.01805	0.03819	0.01708	0.02699	0.07206	1.67385	0.08790	1.70442	0.02420	0.06743	0.04032	0.59793
20	0.00000	0.00203	0.00102	0.69813	0.00085	0.00170	1.43239	1.57080	0.00127	0.00127	0.00127	0.00255	0.45604	0.04076	0.45604	0.04204	0.00192	0.00192	1.00000
21	0.01976	0.15864	0.07932	0.24387	0.03860	0.07721	4.10054	2.80375	0.14454	0.00655	0.08475	0.26178	0.22675	0.09809	0.48024	0.15796	0.32023	0.07858	0.24540
22	0.00755	0.09806	0.04903	0.26111	0.02448	0.04896	3.82976	5.95879	0.13541	0.00205	0.06542	0.23391	0.80508	0.05478	0.82419	0.28662	0.26026	0.03695	0.14196
23	0.00056	0.02678	0.01339	0.82929	0.01162	0.02323	1.20585	1.53788	0.01711	0.00932	0.01366	0.03164	1.91716	0.05732	1.94391	0.07134	0.03217	0.02228	0.69259
24	0.00341	0.06587	0.03293	0.36358	0.01929	0.03859	2.75039	4.16521	0.06723	0.00269	0.03838	0.13060	0.48916	0.06369	0.57833	0.15668	0.13679	0.03172	0.23188
25	0.00047	0.02456	0.01228	0.86360	0.01086	0.02172	1.15794	1.39134	0.01554	0.00984	0.01249	0.02757	1.69933	0.07516	1.72481	0.08153	0.02813	0.02145	0.76257
26	0.00469	0.07731	0.03866	0.43634	0.02497	0.04993	2.29181	2.68258	0.06305	0.02178	0.04044	0.12381	2.34645	0.10955	2.46874	0.11720	0.12158	0.04916	0.40435
27	0.00247	0.05604	0.02802	0.57999	0.02078	0.04157	1.72418	3.00899	0.05018	0.01402	0.03097	0.09468	1.51080	0.07898	1.58086	0.14012	0.09286	0.03382	0.36421
28	0.01984	0.15894	0.07947	0.34722	0.04626	0.09252	2.88004	2.53099	0.15236	0.02969	0.08787	0.24979	0.87132	0.29171	1.03692	0.10700	0.25991	0.09720	0.37397
29	0.00930	0.10881	0.05440	0.51028	0.03828	0.07657	1.95970	2.03154	0.08793	0.03624	0.05853	0.15277	1.23564	0.10955	1.37577	0.16688	0.14774	0.08013	0.54240
30	0.00019	0.01541	0.00771	0.87307	0.00661	0.01323	1.14538	1.71047	0.00999	0.00629	0.00789	0.01851	1.99104	0.11210	2.00633	0.11974	0.01857	0.01279	0.68875
31	0.00048	0.02477	0.01239	0.92567	0.01133	0.02266	1.08030	1.58836	0.01492	0.01077	0.01255	0.02968	2.08531	0.13248	2.10569	0.11337	0.02797	0.02194	0.78437
32	0.00089	0.03374	0.01687	0.72343	0.01378	0.02757	1.38231	2.19442	0.02457	0.00828	0.01749	0.04802	1.83945	0.13248	1.88531	0.12356	0.04975	0.02288	0.45988
33	0.01305	0.12888	0.06444	0.39120	0.03974	0.07948	2.55623	1.93996	0.09784	0.01558	0.06130	0.17700	0.07006	0.16688	0.24331	0.19617	0.18665	0.08899	0.47678
34	0.00020	0.01588	0.00794	0.79849	0.00649	0.01297	1.25237	2.05071	0.01093	0.00501	0.00822	0.02079	2.04837	0.13758	2.06620	0.14522	0.02145	0.01175	0.54795
35	0.00117	0.03862	0.01931	0.83929	0.01711	0.03423	1.19148	1.95144	0.02607	0.01476	0.01972	0.04718	1.10953	0.15159	1.14647	0.17834	0.04717	0.03162	0.67043
36	0.00371	0.06877	0.03439	0.74468	0.02910	0.05820	1.34286	2.05119	0.05360	0.02286	0.03577	0.09659	1.17322	0.21783	1.24583	0.15668	0.09074	0.05212	0.57433
37	0.00383	0.06983	0.03491	0.31356	0.01899	0.03799	3.18917	2.14305	0.05157	0.00518	0.03440	0.09931	1.38214	0.23566	1.47640	0.20891	0.10978	0.04442	0.40459
38	0.00471	0.07741	0.03870	0.27444	0.01970	0.03940	3.64375	4.45170	0.08455	0.01191	0.04753	0.15868	2.16556	0.23566	2.31205	0.17834	0.17865	0.03354	0.18774
39	0.00590	0.08665	0.04333	0.59477	0.03284	0.06567	1.68133	2.11422	0.06419	0.02145	0.04511	0.12382	1.58723	0.19235	1.68149	0.27006	0.12272	0.06118	0.49858
40	0.00121	0.03931	0.01966	0.55813	0.01412	0.02824	1.79168	3.27801	0.03613	0.01267	0.02205	0.06843	1.95410	0.25222	1.99996	0.20382	0.06523	0.02369	0.36317
41	0.00081	0.03208	0.01604	0.58925	0.01174	0.02348	1.69707	2.84127	0.02755	0.01082	0.01737	0.05157	1.74773	0.23057	1.79232	0.20764	0.04754	0.02164	0.45518
42	0.00589	0.08663	0.04331	0.76164	0.03721	0.07442	1.31295	1.69316	0.05962	0.03498	0.04401	0.11096	0.71718	0.31974	0.77068	0.22420	0.10309	0.02729	0.70608
43	0.00299	0.06169	0.03085	0.49022	0.02101	0.04202	2.03990	2.38509	0.04937	0.01612	0.03289	0.09268	1.97958	0.28534	2.05601	0.23566	0.09717	0.03916	0.40303
44	0.00001	0.00287	0.00144	0.78540	0.00127	0.00255	1.27324	1.57080	0.00180	0.00180	0.00180	0.00360	1.71079	0.23312	1.71207	0.23439	0.00272	0.00272	1.00000
45	0.00026	0.01835	0.00918	0.65272	0.00682	0.01364	1.53205	2.73575	0.01585	0.00535	0.00982	0.02793	0.22420	0.25350	0.24968	0.24585	0.02833	0.01189	0.41964
46	0.00343	0.06612	0.03306	0.44087	0.02138	0.04276	2.26825	2.06889	0.05082	0.00572	0.03355	0.09262	0.54776	0.28280	0.63820	0.29554	0.10454	0.04182	0.40004
47	0.00202	0.05072	0.02536	0.85986	0.02293	0.04585	1.16298	1.62463	0.03211	0.02103	0.02573	0.06303	0.25477	0.27006	0.29681	0.31464	0.05878	0.04376	0.74449
48	0.03402	0.20811	0.10405	0.12567	0.03633	0.07265	7.95742	3.24578	0.19821	0.04991	0.12136	0.36923	2.07894	0.27643	2.21906	0.16155	0.39519	0.10959	0.27731
49	0.00094	0.03465	0.01732	0.42883	0.01079	0.02159	2.33192	3.76887	0.03231	0.01060	0.02047	0.06400	2.13499	0.27133	2.18212	0.31210	0.05782	0.02076	0.35904
50	0.00062	0.02809	0.01405	0.73384	0.01145	0.02290	1.36270	1.77473	0.01925	0.00915	0.01448	0.03562	1.38596	0.27898	1.39488	0.31210	0.03676	0.02147	0.58417
51	0.00288	0.06054	0.03027	0.7053															



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-25 23.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾角X	絶対最大長傾角Y	絶対最大長傾角Z	絶対最大長傾角V	楕円長軸	楕円短軸	楕円長短比
52	0.00203	0.05080	0.02540	0.84805	0.02283	0.04566	1.17917	1.56017	0.03262	0.01856	0.02573	0.06193	1.19488	0.33375	1.25093	0.31082	0.05945	0.04341	0.73012
53	0.00033	0.02053	0.01027	0.42797	0.00615	0.01230	2.33661	4.53645	0.02265	0.00272	0.01216	0.04003	2.50059	0.33630	2.50695	0.29808	0.03978	0.01059	0.26630
54	0.00090	0.03383	0.01692	0.52556	0.01170	0.02341	1.90273	2.52843	0.03094	0.00794	0.01849	0.05134	0.61910	0.30700	0.64585	0.34904	0.05225	0.02191	0.41923
55	0.00301	0.06189	0.03095	0.40585	0.01914	0.03829	2.46398	3.18013	0.05364	0.00187	0.03159	0.10717	0.84202	0.30700	0.90062	0.39490	0.10982	0.03488	0.31761
56	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	1.51589	0.30827	1.51844	0.31082	0.00424	0.00424	1.00000
57	0.00008	0.00996	0.00498	0.92484	0.00420	0.00841	1.08127	2.35663	0.00674	0.00415	0.00519	0.01342	2.04837	0.31846	2.05601	0.30955	0.01190	0.00834	0.70063
58	0.00001	0.00407	0.00203	0.69813	0.00170	0.00340	1.43239	1.74533	0.00269	0.00180	0.00224	0.00537	1.52990	0.31464	1.53118	0.31846	0.00546	0.00303	0.55527
59	0.00031	0.02002	0.01001	0.87030	0.00874	0.01748	1.14902	1.80321	0.01273	0.00800	0.01021	0.02517	1.09042	0.32229	1.10826	0.33757	0.02314	0.01732	0.74841
60	0.00040	0.02259	0.01130	0.43541	0.00687	0.01374	2.29670	4.84703	0.02516	0.00550	0.01364	0.04586	2.59995	0.32483	2.59995	0.36942	0.04060	0.01257	0.30958
61	0.00303	0.06216	0.03108	0.73708	0.02611	0.05223	1.35670	1.61571	0.04156	0.02220	0.03153	0.07732	0.22420	0.35031	0.29426	0.37961	0.07798	0.04955	0.63538
62	0.00088	0.03346	0.01673	0.61036	0.01250	0.02501	1.63837	2.57524	0.02588	0.01229	0.01807	0.05137	1.45347	0.37706	1.46621	0.32866	0.04753	0.02356	0.49569
63	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	1.61527	0.34394	1.61782	0.34649	0.00424	0.00424	1.00000
64	0.00014	0.01325	0.00663	0.90167	0.00569	0.01138	1.10905	1.81369	0.00846	0.00570	0.00674	0.01614	0.69807	0.35413	0.70954	0.36305	0.01490	0.01178	0.79065
65	0.00043	0.02344	0.01172	0.85525	0.01024	0.02049	1.16925	1.63964	0.01454	0.00963	0.01189	0.02836	1.75283	0.36942	1.77576	0.35541	0.02683	0.02049	0.76375
66	0.00017	0.01452	0.00726	0.76328	0.00575	0.01151	1.31014	2.49015	0.01127	0.00543	0.00770	0.02079	0.73756	0.37324	0.75540	0.38088	0.01990	0.01059	0.53224
67	0.00107	0.03696	0.01848	0.72027	0.01509	0.03018	1.38836	1.89024	0.02513	0.01216	0.01902	0.04889	1.13246	0.41273	1.15666	0.37197	0.04703	0.02904	0.61755
68	0.00749	0.09767	0.04883	0.68882	0.03994	0.07988	1.45175	1.91138	0.07145	0.02932	0.05098	0.13306	1.33755	0.37451	1.44456	0.45095	0.13620	0.07004	0.51426
69	0.00401	0.07145	0.03573	0.77153	0.03080	0.06160	1.29612	1.86450	0.04817	0.02782	0.03647	0.09576	0.65349	0.37579	0.71336	0.44840	0.08797	0.05804	0.65973
70	0.00011	0.01177	0.00588	0.86354	0.00486	0.00972	1.15802	2.14050	0.00776	0.00433	0.00605	0.01531	2.53243	0.37834	2.54390	0.38598	0.01454	0.00952	0.65478
71	0.00837	0.10324	0.05162	0.64407	0.04087	0.08173	1.55263	1.72363	0.06905	0.03397	0.05295	0.13371	0.46878	0.38088	0.49426	0.51082	0.13689	0.07787	0.56884
72	0.00000	0.00144	0.00072	0.78540	0.00064	0.00127	1.27324	1.57080	0.00064	0.00064	0.00064	0.00180	2.04837	0.37961	2.04837	0.37961	0.00102	0.00102	1.00000
73	0.00079	0.03182	0.01591	0.57644	0.01145	0.02289	1.73480	2.58864	0.02625	0.00642	0.01676	0.04851	0.41273	0.38471	0.43821	0.42420	0.05155	0.01940	0.37637
74	0.00001	0.00287	0.00144	0.78540	0.00127	0.00255	1.27324	1.57080	0.00180	0.00180	0.00180	0.00360	1.64328	0.38471	1.64455	0.38598	0.00272	0.00272	1.00000
75	0.02061	0.16197	0.08099	0.29252	0.04323	0.08646	3.41857	3.78507	0.16255	0.02628	0.09230	0.31103	1.81270	0.39362	1.86238	0.69935	0.31740	0.08266	0.26042
76	0.00699	0.09435	0.04718	0.28677	0.02470	0.04939	3.48712	2.95757	0.08394	0.00799	0.04836	0.15862	0.00764	0.50572	0.12356	0.39999	0.17244	0.05163	0.29939
77	0.00001	0.00287	0.00144	0.78540	0.00127	0.00255	1.27324	1.57080	0.00180	0.00180	0.00180	0.00360	1.64965	0.40509	1.65092	0.40636	0.00272	0.00272	1.00000
78	0.00870	0.10523	0.05262	0.49614	0.03648	0.07297	2.01557	1.69258	0.07304	0.02317	0.05321	0.13477	1.07132	0.41018	1.14138	0.52356	0.14890	0.07438	0.49951
79	0.00469	0.07729	0.03864	0.48569	0.02636	0.05273	2.05891	2.65429	0.06873	0.00626	0.04101	0.12326	0.75030	0.54649	0.76559	0.42547	0.13898	0.04298	0.30923
80	0.00073	0.03049	0.01525	0.52065	0.01042	0.02085	1.92067	2.50069	0.02521	0.00478	0.01639	0.04569	1.88149	0.44330	1.90569	0.48024	0.05022	0.01852	0.36872
81	0.00225	0.05351	0.02676	0.64743	0.02096	0.04192	1.54457	2.58802	0.04512	0.01666	0.02899	0.08381	0.18853	0.46496	0.26878	0.48407	0.08305	0.03448	0.41522
82	0.00006	0.00886	0.00443	0.64541	0.00297	0.00594	1.54939	3.54920	0.00726	0.00193	0.00487	0.01394	2.55154	0.45222	2.56300	0.45732	0.01448	0.00542	0.37454
83	0.00308	0.06261	0.03130	0.32597	0.01730	0.03461	3.06776	3.40429	0.05954	0.00365	0.03362	0.11185	2.35027	0.50317	2.45345	0.46368	0.11731	0.03341	0.28480
84	0.00120	0.03907	0.01954	0.77103	0.01658	0.03315	1.29697	1.51610	0.02565	0.01400	0.01988	0.04649	2.04454	0.46751	2.06620	0.50700	0.04786	0.03190	0.66651
85	0.03001	0.19546	0.09773	0.79416	0.08652	0.17304	1.25919	1.22142	0.11622	0.08586	0.09816	0.21460	1.41398	0.51973	1.59360	0.63438	0.21068	0.18134	0.86077
86	0.00187	0.04885	0.02443	0.44626	0.01572	0.03144	2.24084	4.25886	0.05558	0.00947	0.02979	0.09712	1.66748	0.47260	1.67512	0.56814	0.10301	0.02317	0.22490
87	0.02694	0.18520	0.09260	0.33807	0.05328	0.10655	2.95797	2.30772	0.16064	0.06429	0.09762	0.27839	0.80381	0.62292	1.07641	0.57324	0.25381	0.13514	0.53242
88	0.00607	0.08794	0.04397	0.37017	0.02619	0.05238	2.70144	2.19298	0.06889	0.00312	0.04462	0.12749	0.58215	0.48407	0.62546	0.60254	0.13553	0.05706	0.42099
89	0.00253	0.05672	0.02836	0.64702	0.02224	0.04449	1.54555	1.69883	0.03951	0.01933	0.02907	0.07209	2.07002	0.52101	2.14008	0.53120	0.07119	0.04519	0.63478
90	0.01510	0.13867	0.06933	0.47450	0.04720	0.09439	2.10749	1.94813	0.09948	0.03779	0.07015	0.19126	1.96939	0.51082	2.05983	0.67769	0.19309	0.09959	0.51574
91	0.00766	0.09874	0.04937	0.73898	0.04186	0.08371	1.35321	1.53378	0.06605	0.03640	0.05058	0.12060	0.00764	0.60381	0.11210	0.54649	0.12279	0.07940	0.64663
92	0.00521	0.08143	0.04071	0.34211	0.02323	0.04647	2.92303	4.05467	0.08497	0.01885	0.04791	0.15996	0.74139	0.68788	0.80508	0.54266	0.15280	0.04339	0.28396
93	0.00818	0.10209	0.05104	0.49511	0.03535	0.07069	2.01977	2.43329	0.07995	0.02154	0.05247	0.15672	2.41269	0.55285	2.52352	0.66113	0.16493	0.06319	0.38311
94	0.00929	0.10876	0.05438	0.37462	0.03271	0.06541	2.66940	2.80271	0.10220	0.02983	0.05879	0.17892	0.40254	0.73374	0.42802	0.55795	0.17642	0.06705	0.38002
95	0.00636	0.08998	0.04499	0.66493	0.03609	0.07219	1.50393	1.83238	0.06283	0.02709	0.04633	0.11983	1.85998	0.57578	0.30318	0.59362	0.12183	0.06646	0.54557
96	0.00720	0.09578	0.04789	0.27281	0.02444	0.04889	3.66562	3.47096	0.09173	0.01596	0.05212	0.17438	1.59997	0.68151	1.74137	0.58215	0.18469	0.04967	0.26894
97	0.00112	0.03778	0.01889	0.73248	0.01559	0.03118	1.36523	1.86960	0.02566	0.01310	0.01940	0.04982	1.31207	0.63438	1.32354	0.58725	0.04953	0.02882	0.58194
98	0.00198	0.05021	0.02510	0.65918	0.01982	0.03964	1.51703	2.03528	0.04108	0.01672	0.02640	0.06966	2.27129	0.59234	2.31333	0.64585	0.06931	0.03637	0.52469
99	0.00001	0.00352	0.00176	0.75398	0.00153	0.00306	1.32629	1.47262	0.00214	0.00127	0.00185	0.00427	1.74519	0.59999	1.74646	0.60254	0.00349	0.00349	1.00000
100	0.00174	0.04713	0.02356	0.72776	0.01953	0.03906	1.37409	2.17567	0.03497	0.01159	0.02452	0.06753	1.93015	0.60126	1.93372	0.65986	0.06852	0.03242	0.47309
101	0.00064	0.02860	0.01430	0.77939	0.01202	0.02404	1.28306	1.74627	0.01898	0.01088	0.01466	0.03599	2.57447	0.62546	2.59995	0.60254	0.03477	0.02353	0.67694
102	0.00111	0.03759	0.0																



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-25 23.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾角X	絶対最大長傾角Y	絶対最大長傾角Z	絶対最大長傾角V	楕円長軸	楕円短軸	楕円長短比
103	0.00345	0.06623	0.03311	0.75348	0.02817	0.05633	1.32718	1.43567	0.03973	0.02496	0.03410	0.07776	0.56814	0.68916	0.60126	0.62037	0.08158	0.05377	0.65914
104	0.00042	0.02300	0.01150	0.44154	0.00708	0.01415	2.26481	3.77171	0.02198	0.00217	0.01320	0.04136	2.40887	0.67005	2.42415	0.63311	0.04651	0.01137	0.24454
105	0.00064	0.02857	0.01428	0.58019	0.01031	0.02061	1.72358	3.26326	0.02585	0.00616	0.01583	0.04889	2.21906	0.68916	2.24327	0.64839	0.04844	0.01685	0.34784
106	0.00692	0.09384	0.04692	0.76397	0.04045	0.08090	1.30896	1.54597	0.06491	0.03487	0.04796	0.11508	0.07006	0.65222	0.12739	0.75030	0.11769	0.07482	0.63573
107	0.00046	0.02422	0.01211	0.45690	0.00763	0.01525	2.18869	3.63477	0.02461	0.00681	0.01429	0.04303	2.56300	0.65604	2.59995	0.67515	0.04473	0.01312	0.29325
108	0.00007	0.00953	0.00477	0.82486	0.00375	0.00750	1.21233	2.68084	0.00682	0.00340	0.00505	0.01352	1.02036	0.66623	1.03055	0.65986	0.01296	0.00701	0.54108
109	0.00163	0.04561	0.02281	0.75961	0.01930	0.03859	1.31646	2.10770	0.03266	0.01560	0.02365	0.06429	1.39233	0.67387	1.44201	0.71209	0.05952	0.03495	0.58727
110	0.01048	0.11549	0.05775	0.30113	0.03112	0.06223	3.32077	4.09083	0.12035	0.00815	0.06772	0.22938	1.18087	0.69425	1.35411	0.84202	0.25354	0.05261	0.20751
111	0.00021	0.01620	0.00810	0.82551	0.00675	0.01351	1.21137	1.98350	0.01082	0.00617	0.00830	0.02094	2.07894	0.70062	2.09550	0.69043	0.02066	0.01270	0.61491
112	0.00931	0.10887	0.05444	0.52642	0.03893	0.07785	1.89961	2.73282	0.09811	0.02258	0.05890	0.17738	2.28276	0.85476	2.38721	0.71336	0.17572	0.06745	0.38386
113	0.00067	0.02914	0.01457	0.49137	0.00963	0.01926	2.03514	3.54889	0.02967	0.00656	0.01666	0.05177	2.58466	0.70572	2.59358	0.75540	0.05327	0.01594	0.29921
114	0.00002	0.00557	0.00278	0.73631	0.00239	0.00478	1.35812	1.63625	0.00356	0.00191	0.00294	0.00712	1.98595	0.71463	1.98849	0.71973	0.00707	0.00438	0.61930
115	0.00352	0.06694	0.03347	0.75649	0.02853	0.05706	1.32189	1.78760	0.04562	0.02430	0.03416	0.08771	1.00507	0.74393	1.08533	0.77578	0.08622	0.05198	0.60288
116	0.01771	0.15018	0.07509	0.31120	0.04132	0.08264	3.21338	2.54530	0.12684	0.03822	0.08053	0.23633	0.86877	0.73120	0.93501	0.95667	0.25227	0.08940	0.35440
117	0.00158	0.04481	0.02241	0.77065	0.01912	0.03824	1.29761	1.91748	0.03332	0.01484	0.02321	0.06032	1.77194	0.79744	1.78595	0.74011	0.05898	0.03405	0.57722
118	0.00481	0.07824	0.03912	0.55514	0.02858	0.05717	1.80136	2.21741	0.06944	0.02673	0.04197	0.11426	0.43184	0.74903	0.52483	0.81272	0.11147	0.05492	0.49270
119	0.00077	0.03123	0.01561	0.65449	0.01205	0.02410	1.52790	2.84900	0.02770	0.01022	0.01702	0.05028	1.51844	0.74903	1.54519	0.78979	0.04819	0.02024	0.41996
120	0.00726	0.09614	0.04807	0.77497	0.04173	0.08347	1.29037	1.73731	0.06622	0.03092	0.04942	0.12497	0.03057	0.75158	0.05605	0.87259	0.12988	0.07117	0.54800
121	0.00024	0.01737	0.00868	0.77582	0.00709	0.01418	1.28895	2.26076	0.01247	0.00588	0.00921	0.02421	0.91336	0.75412	0.92355	0.77451	0.02388	0.01263	0.52904
122	0.00076	0.03113	0.01556	0.58578	0.01136	0.02272	1.70712	2.99083	0.02665	0.00569	0.01674	0.05134	2.15537	0.78088	2.19741	0.75412	0.04891	0.01981	0.40506
123	0.00523	0.08162	0.04081	0.62610	0.03172	0.06345	1.59720	1.71931	0.05622	0.02517	0.04182	0.10514	0.10700	0.80381	0.20127	0.76049	0.10650	0.06254	0.58724
124	0.00052	0.02575	0.01288	0.75701	0.01062	0.02124	1.32099	2.06796	0.01944	0.00818	0.01346	0.03511	1.57704	0.78597	1.60251	0.76432	0.03587	0.01849	0.51552
125	0.00141	0.04235	0.02117	0.23833	0.00976	0.01953	4.19585	7.42118	0.06918	0.00172	0.03172	0.10897	1.92608	0.77068	2.03181	0.79107	0.11740	0.01528	1.13011
126	0.00001	0.00287	0.00144	0.78540	0.00127	0.00255	1.27324	1.57080	0.00180	0.00180	0.00180	0.00360	0.58215	0.77705	0.58343	0.77833	0.00272	0.00272	1.00000
127	0.00223	0.02666	0.01333	0.68309	0.02147	0.04294	1.46394	1.60361	0.03630	0.01912	0.02742	0.06579	0.74139	0.80508	0.75158	0.86877	0.06981	0.04073	0.58339
128	0.00996	0.11263	0.05632	0.38024	0.03417	0.06834	2.62995	2.80319	0.09355	0.01577	0.05945	0.18557	1.78850	0.83056	1.95028	0.91845	0.20610	0.06155	0.29864
129	0.00334	0.06526	0.03263	0.26425	0.01621	0.03241	3.78433	5.21276	0.08084	0.01258	0.04308	0.14397	1.14647	0.84202	1.28787	0.86113	0.13864	0.03071	0.22154
130	0.00049	0.02498	0.01249	0.34104	0.00672	0.01344	2.93219	4.07839	0.02665	0.00154	0.01513	0.04649	1.62290	0.81400	1.66239	0.83565	0.05577	0.01119	0.20061
131	0.00055	0.02643	0.01321	0.75110	0.01086	0.02172	1.33138	2.16417	0.01905	0.00749	0.01382	0.03687	2.38849	0.83183	2.41906	0.81400	0.03690	0.01893	0.51294
132	0.00077	0.03133	0.01566	0.65229	0.01208	0.02416	1.53307	2.66703	0.02521	0.00979	0.01680	0.04885	1.95537	0.86622	1.96174	0.81909	0.04963	0.01978	0.39850
133	0.00015	0.01379	0.00689	0.57106	0.00464	0.00928	1.75113	3.70446	0.01212	0.00243	0.00771	0.02364	1.49551	0.84966	1.50443	0.82928	0.02372	0.00801	0.33779
134	0.00066	0.02907	0.01453	0.53671	0.01009	0.02019	1.86321	3.35879	0.02674	0.00471	0.01588	0.05050	2.46237	0.83183	2.47638	0.87896	0.05319	0.01589	0.29873
135	0.00037	0.02166	0.01083	0.67350	0.00831	0.01662	1.48479	2.94069	0.01784	0.00577	0.01176	0.03473	1.10316	0.85094	1.13119	0.83310	0.03319	0.01413	0.42574
136	0.00020	0.01613	0.00807	0.85489	0.00687	0.01375	1.16974	2.28996	0.01146	0.00612	0.00837	0.02250	2.22925	0.84584	2.24581	0.83310	0.02013	0.01293	0.64263
137	0.00052	0.02579	0.01290	0.49615	0.00849	0.01699	2.01554	4.10240	0.02719	0.00510	0.01519	0.04885	0.34267	0.83820	0.34904	0.88533	0.04800	0.01386	0.28876
138	0.00844	0.10369	0.05185	0.57753	0.03883	0.07766	1.73151	1.77419	0.07640	0.02674	0.05366	0.13612	1.41144	0.85094	1.49296	0.95794	0.14269	0.07535	0.52807
139	0.00236	0.05485	0.02742	0.53459	0.01947	0.03895	1.87061	2.45785	0.04457	0.01309	0.02945	0.08352	2.12098	0.93374	2.13881	0.85349	0.08536	0.03524	0.41289
140	0.00475	0.07775	0.03888	0.77452	0.03364	0.06728	1.29112	1.76379	0.05339	0.03140	0.03966	0.10153	0.56814	0.87005	0.62419	0.95285	0.09498	0.06365	0.67008
141	0.00281	0.05982	0.02991	0.51256	0.02084	0.04169	1.95099	2.45170	0.05215	0.01762	0.03315	0.09117	0.37197	0.89425	0.45732	0.92227	0.09046	0.03956	0.43732
142	0.00152	0.04393	0.02196	0.73523	0.01828	0.03655	1.36011	2.10421	0.03298	0.01326	0.02300	0.06184	2.26237	0.87387	2.29040	0.92737	0.05996	0.03219	0.53683
143	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	1.56430	0.87514	1.56685	0.87896	0.00519	0.00477	0.91906
144	0.00151	0.04379	0.02189	0.78363	0.01880	0.03761	1.27611	1.66850	0.02831	0.01526	0.02238	0.05487	2.33753	0.90699	2.38212	0.87769	0.05328	0.03599	0.67542
145	0.00183	0.04828	0.02414	0.82930	0.02141	0.04283	1.20584	1.66683	0.03038	0.01965	0.02459	0.06072	1.97066	0.88533	2.02289	0.91336	0.05634	0.04137	0.73429
146	0.00065	0.02878	0.01439	0.73946	0.01179	0.02358	1.35233	2.29224	0.02288	0.00857	0.01494	0.04152	1.82289	0.88915	1.86238	0.89680	0.04110	0.02016	0.49050
147	0.00107	0.03690	0.01845	0.82960	0.01623	0.03247	1.20541	2.01855	0.02558	0.01311	0.01903	0.05064	1.12991	0.91845	1.17195	0.89298	0.04692	0.02902	0.61858
148	0.00333	0.06510	0.03255	0.61628	0.02497	0.04994	1.62263	2.29985	0.05247	0.01792	0.03402	0.09648	0.28662	0.89170	0.31974	0.98087	0.09454	0.04482	0.47409
149	0.00075	0.03093	0.01546	0.47633	0.01009	0.02017	2.09937	3.16690	0.02833	0.00589	0.01737	0.05202	2.30314	0.89298	2.31333	0.94266	0.05735	0.01668	0.29087
150	0.01658	0.14530	0.07265	0.27836	0.03776	0.07553	3.59253	2.47456	0.11518	0.04793	0.07743	0.22519	0.47388	0.90699	0.56050	1.11335	0.21551	0.09796	0.45455
151	0.00000	0.00144	0.00072	0.78540	0.00064	0.00127	1.27324	1.57080	0.00064	0.00064	0.00064	0.00180	1.01909	0.89934	1.01909	0.89934	0.00102	0.00102	1.00000
152	0.00750	0.09772	0.04886	0.49333	0.03377	0.06753	2.02703	3.37454	0.08894	0.02344	0.05619	0.17663	1.63564	1.02164	1.76429	0.90317	0.18581	0.05139	0.2



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-25 23.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸点X	絶対最大長軸点Y	絶対最大長傾点X	絶対最大長傾点Y	楕円長軸	楕円短軸	楕円長短比
154	0.00040	0.02264	0.01132	0.61828	0.00831	0.01661	1.61738	2.74875	0.01958	0.00637	0.01233	0.03502	2.59358	0.92992	2.59995	0.96304	0.03566	0.01437	0.40283
155	0.00344	0.06618	0.03309	0.55832	0.02415	0.04830	1.79108	2.39684	0.05719	0.02076	0.03558	0.10007	1.97448	0.94775	2.00760	1.04074	0.09429	0.04645	0.49268
156	0.00466	0.07702	0.03851	0.59245	0.02908	0.05815	1.68792	2.64055	0.06764	0.02433	0.04189	0.12277	2.30059	1.01272	2.41778	0.98087	0.11557	0.05133	0.44414
157	0.00742	0.09721	0.04861	0.43057	0.03133	0.06266	2.32252	2.37216	0.08776	0.00973	0.05178	0.14708	0.66368	1.04074	0.77960	0.95285	0.16899	0.05592	0.33092
158	0.00025	0.01778	0.00889	0.76446	0.00719	0.01438	1.30812	2.27186	0.01393	0.00587	0.00934	0.02480	1.17068	0.99234	1.17959	0.97068	0.02374	0.01332	0.56094
159	0.00000	0.00144	0.00072	0.78540	0.00064	0.00127	1.27324	1.57080	0.00064	0.00064	0.00064	0.00180	1.83054	0.97705	1.83054	0.97705	0.00102	0.00102	1.00000
160	0.00001	0.00287	0.00144	0.78540	0.00127	0.00255	1.27324	1.57080	0.00180	0.00180	0.00180	0.00360	1.20762	0.97960	1.20889	0.98087	0.00272	0.00272	1.00000
161	0.00000	0.00203	0.00102	0.69813	0.00085	0.00170	1.43239	1.57080	0.00127	0.00127	0.00127	0.00255	1.22927	0.98851	1.23055	0.98851	0.00192	0.00192	1.00000
162	0.00665	0.09199	0.04600	0.39414	0.02829	0.05659	2.53720	2.69507	0.08357	0.01873	0.05123	0.14798	2.46110	1.05476	2.59995	1.00762	0.16831	0.05028	0.29874
163	0.00395	0.07093	0.03546	0.63465	0.02768	0.05536	1.57568	1.55680	0.04851	0.02337	0.03651	0.08670	0.01401	1.06112	0.08662	1.01654	0.09062	0.05552	0.61267
164	0.00000	0.00144	0.00072	0.78540	0.00064	0.00127	1.27324	1.57080	0.00064	0.00064	0.00064	0.00180	1.78213	0.99488	1.78213	0.99488	0.00102	0.00102	1.00000
165	0.00279	0.05958	0.02979	0.37981	0.01778	0.03557	2.63286	2.55316	0.05093	0.00320	0.03030	0.09221	1.10316	1.05348	1.18724	1.01909	0.10773	0.03295	0.50582
166	0.00071	0.03001	0.01501	0.54515	0.01052	0.02104	1.83436	2.48206	0.02373	0.00709	0.01617	0.04489	2.42798	1.00125	2.43944	1.04329	0.04732	0.01904	0.40224
167	0.00129	0.04060	0.02030	0.63670	0.01563	0.03125	1.57060	2.07030	0.03273	0.01027	0.02136	0.05636	1.72226	1.05221	1.76684	1.02036	0.05874	0.02807	0.47791
168	0.00184	0.04843	0.02421	0.78053	0.02081	0.04163	1.28119	1.70868	0.03278	0.01470	0.02461	0.06159	1.45857	1.04074	1.50952	1.00890	0.06046	0.03879	0.64154
169	0.00326	0.06439	0.03220	0.78121	0.02788	0.05576	1.28006	1.62028	0.04257	0.02573	0.03265	0.08030	1.23819	1.05603	1.31335	1.03183	0.07599	0.05457	0.71810
170	0.00097	0.03518	0.01759	0.46508	0.01139	0.02279	2.15018	4.24326	0.03986	0.00858	0.02136	0.06884	2.16047	1.02928	2.22798	1.03183	0.06855	0.01805	0.26339
171	0.00217	0.05254	0.02627	0.37901	0.01561	0.03122	2.63843	3.71438	0.05449	0.01773	0.03153	0.09775	2.37702	1.12354	2.39740	1.02928	0.09954	0.02773	0.27861
172	0.00034	0.02083	0.01041	0.74739	0.00842	0.01683	1.33798	1.22125	0.01469	0.00684	0.01079	0.02836	2.33116	1.04839	2.35409	1.03437	0.02803	0.01548	0.55211
173	0.03901	0.22288	0.11144	0.27161	0.05751	0.11502	3.68170	2.26737	0.20617	0.04575	0.12065	0.33232	0.85858	1.03183	1.12100	1.23310	0.36304	0.13683	0.37690
174	0.00095	0.03483	0.01741	0.25000	0.00814	0.01627	4.00005	8.27255	0.05064	0.00405	0.02557	0.09359	2.23690	1.03310	2.26492	1.12100	0.10557	0.01149	0.10882
175	0.00502	0.07993	0.03996	0.64341	0.03149	0.06297	1.55421	2.32894	0.06382	0.02163	0.04196	0.11981	1.81908	1.03947	1.65347	1.15284	0.11648	0.05485	0.47089
176	0.00017	0.01473	0.00736	0.82078	0.00609	0.01218	1.21835	2.36076	0.01040	0.00502	0.00769	0.02066	0.88661	1.04456	0.90062	1.05730	0.01907	0.01138	0.59665
177	0.00000	0.00249	0.00124	0.58905	0.00096	0.00191	1.69765	2.35619	0.00191	0.00064	0.00127	0.00382	2.37320	1.05348	2.37575	1.05348	0.00383	0.00162	0.42181
178	0.00009	0.01066	0.00533	0.50023	0.00317	0.00635	1.99908	4.32082	0.01022	0.00254	0.00617	0.01866	0.75540	1.05476	0.76049	1.07132	0.02051	0.00554	0.27019
179	0.00696	0.09412	0.04706	0.58819	0.03553	0.07106	1.70013	2.36068	0.07387	0.02849	0.05002	0.14236	0.25987	1.17322	0.35541	1.07004	0.13513	0.06556	0.48521
180	0.00054	0.02615	0.01308	0.85655	0.01154	0.02308	1.16747	1.79797	0.01689	0.00938	0.01348	0.03344	2.00760	1.08405	2.03308	1.06495	0.03280	0.02085	0.63562
181	0.00008	0.00985	0.00493	0.89248	0.00405	0.00809	1.12048	2.13834	0.00629	0.00381	0.00506	0.01252	0.14777	1.07004	0.15668	1.07641	0.01173	0.00828	0.70594
182	0.00354	0.06714	0.03357	0.78259	0.02911	0.05822	1.27781	1.48831	0.04190	0.02541	0.03381	0.08029	2.42543	1.12482	2.48530	1.07386	0.07758	0.05811	0.74913
183	0.00180	0.04787	0.02393	0.44371	0.01539	0.03079	2.25370	3.14962	0.04341	0.00860	0.02612	0.08203	1.18469	1.09807	1.26494	1.08915	0.08775	0.02611	0.29756
184	0.00190	0.04919	0.02459	0.74252	0.02061	0.04121	1.34677	1.71685	0.03432	0.01839	0.02502	0.06266	2.51969	1.07641	2.55154	1.12864	0.05874	0.04119	0.70126
185	0.00005	0.00774	0.00387	0.75294	0.00336	0.00672	1.32812	1.59896	0.00491	0.00317	0.00398	0.00979	0.45859	1.08533	0.46496	1.08023	0.00861	0.00696	0.80817
186	0.00009	0.01046	0.00523	0.37396	0.00266	0.00531	2.67410	5.81463	0.01262	0.00233	0.00667	0.02094	2.09168	1.10444	2.10824	1.09425	0.02185	0.00501	0.22935
187	0.00483	0.07841	0.03921	0.34644	0.02250	0.04500	2.88647	2.32102	0.05980	0.01964	0.04139	0.11649	2.10314	1.13756	2.21651	1.11717	0.12333	0.04986	0.40428
188	0.00010	0.01104	0.00552	0.69540	0.00400	0.00800	1.43801	2.87758	0.00823	0.00321	0.00588	0.01627	0.75540	1.11208	0.76049	1.09807	0.01741	0.00700	0.40219
189	0.00000	0.00144	0.00072	0.78540	0.00064	0.00127	1.27324	1.57080	0.00064	0.00064	0.00064	0.00180	0.81654	1.09934	0.81654	1.09934	0.00102	0.00102	1.00000
190	0.00248	0.05621	0.02810	0.63588	0.02183	0.04367	1.57263	2.24368	0.04442	0.01465	0.02966	0.08203	0.70954	1.18214	0.71846	1.10189	0.08700	0.03631	0.41735
191	0.00000	0.00203	0.00102	0.69813	0.00085	0.00170	1.43239	1.57080	0.00127	0.00127	0.00127	0.00255	1.88659	1.10953	1.88786	1.10953	0.00192	0.00192	1.00000
192	0.00796	0.10068	0.05034	0.46575	0.03377	0.06755	2.14708	2.68851	0.09047	0.01176	0.05243	0.16229	1.51080	1.27386	1.54774	1.11717	0.17778	0.05702	0.32072
193	0.00000	0.00144	0.00072	0.78540	0.00064	0.00127	1.27324	1.57080	0.00064	0.00064	0.00064	0.00180	1.05476	1.12737	1.05476	1.12737	0.00102	0.00102	1.00000
194	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	1.07259	1.13119	1.07768	1.13501	0.00712	0.00580	0.81492
195	0.00040	0.02254	0.01127	0.89026	0.01008	0.02016	1.12327	1.76206	0.01492	0.00893	0.01154	0.02836	2.32989	1.15412	2.34390	1.13119	0.02735	0.01858	0.67933
196	0.00059	0.02750	0.01375	0.61864	0.01024	0.02048	1.61646	2.58812	0.02263	0.00749	0.01475	0.04188	0.34649	1.14138	0.36305	1.17832	0.04091	0.01849	0.45192
197	0.00257	0.05715	0.02858	0.51436	0.01993	0.03986	1.94415	2.41225	0.04529	0.01131	0.03018	0.08632	0.63183	1.14647	0.67769	1.21781	0.09037	0.03615	0.39999
198	0.00007	0.00920	0.00460	0.20590	0.00160	0.00320	4.85676	7.70121	0.01120	0.00198	0.00642	0.01954	1.07896	1.15029	1.09679	1.14647	0.02381	0.00356	0.14939
199	0.00697	0.09419	0.04710	0.27588	0.02418	0.04836	3.62478	2.63918	0.08156	0.00536	0.04782	0.14957	1.68532	1.14775	1.70825	1.29424	0.17985	0.04933	0.27427
200	0.00009	0.01046	0.00523	0.83320	0.00417	0.00835	1.20019	2.45437	0.00741	0.00393	0.00542	0.01433	1.15029	1.16176	1.15794	1.15157	0.01307	0.00838	0.64103
201	0.00008	0.00985	0.00493	0.31554	0.00225	0.00450	3.16920	6.16582	0.01328	0.00243	0.00674	0.01987	2.20760	1.16303	2.22543	1.15794	0.01930	0.00503	0.26078
202	0.00184	0.04840	0.02420	0.76838	0.02066	0.04132	1.30144	1.56366	0.03130	0.01828	0.02452	0.05895	1.75283	1.17195	1.80761	1.18978	0.05781	0.04053	0.70107
203	0.00888	0.10635	0.05317	0.44213	0.03477	0.06955	2.26180	2.64664	0.09206	0.02574	0.05809	0.17016	0.38471	1.17832	0.44076	1.33755	0.18051	0.06265	0.34710
20																			



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-25 23.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸X	絶対最大長軸Y	絶対最大長軸Z	絶対最大長軸V	楕円長軸	楕円短軸	楕円長短比
205	0.00019	0.01548	0.00774	0.84123	0.00649	0.01298	1.18873	2.13808	0.01039	0.00562	0.00794	0.02070	1.30825	1.22036	1.31972	1.20507	0.01932	0.01240	0.64206
206	0.02730	0.18645	0.09322	0.45216	0.06212	0.12424	2.21162	3.01960	0.17559	0.03136	0.10345	0.32105	2.25728	1.20634	2.40377	1.49042	0.33806	0.10283	0.30417
207	0.00000	0.00144	0.00072	0.78540	0.00064	0.00127	1.27324	1.57080	0.00064	0.00064	0.00064	0.00180	0.74393	1.21144	0.74393	1.21144	0.00102	0.00102	1.00000
208	0.00345	0.06632	0.03316	0.33074	0.01851	0.03702	3.02351	5.22510	0.09607	0.01574	0.04614	0.14714	2.35664	1.27768	2.49804	1.24201	0.14359	0.03063	0.21334
209	0.00001	0.00287	0.00144	0.78540	0.00127	0.00255	1.27324	1.57080	0.00180	0.00180	0.00180	0.00360	0.34394	1.23819	0.34522	1.23946	0.00272	0.00272	1.00000
210	0.00299	0.06174	0.03087	0.46145	0.02041	0.04081	2.16707	3.00192	0.05583	0.00456	0.03358	0.10409	0.03567	1.28532	0.13248	1.25093	0.11177	0.03410	0.30511
211	0.00001	0.00352	0.00176	0.75398	0.00153	0.00306	1.32629	1.47262	0.00214	0.00127	0.00185	0.00427	1.34647	1.24074	1.34902	1.24201	0.00349	0.00349	1.00000
212	0.00787	0.10010	0.05005	0.28872	0.02632	0.05263	3.46359	4.64386	0.10663	0.01626	0.06039	0.21108	0.70572	1.42417	0.81782	1.24711	0.24371	0.04112	0.16871
213	0.00041	0.02282	0.01141	0.80660	0.00966	0.01932	1.23977	2.10290	0.01603	0.00791	0.01181	0.03120	1.27386	1.27004	1.29934	1.28532	0.02991	0.01741	0.58187
214	0.00448	0.07554	0.03777	0.41159	0.02365	0.04730	2.42961	3.04959	0.06519	0.00859	0.04068	0.12875	1.41781	1.28787	1.51844	1.36558	0.13611	0.04193	0.30802
215	0.00130	0.04066	0.02033	0.44905	0.01304	0.02608	2.22692	3.29942	0.03931	0.00350	0.02260	0.07069	1.80888	1.29042	1.87385	1.31462	0.07980	0.02071	0.25953
216	0.00026	0.01835	0.00918	0.73466	0.00730	0.01460	1.36117	2.41662	0.01366	0.00500	0.00970	0.02649	0.57706	1.29297	0.59999	1.30316	0.02689	0.01252	0.46560
217	0.00075	0.03086	0.01543	0.48930	0.01022	0.02043	2.04373	2.61976	0.02618	0.00829	0.01686	0.04728	2.01015	1.32354	2.05346	1.30825	0.05019	0.01898	0.37813
218	0.00085	0.03293	0.01647	0.33991	0.00904	0.01808	2.94197	4.55430	0.03438	0.00223	0.01929	0.06618	2.39995	1.29806	2.43434	1.35284	0.07023	0.01545	0.21995
219	0.00746	0.09746	0.04873	0.59705	0.03708	0.07417	1.67489	2.27429	0.07370	0.03043	0.05117	0.14475	0.98342	1.44710	1.02800	1.31080	0.13508	0.07031	0.52050
220	0.00251	0.05655	0.02828	0.42418	0.01785	0.03570	2.35747	2.46057	0.04741	0.00847	0.02918	0.08598	0.07771	1.31207	0.12484	1.38214	0.09262	0.03453	0.37280
221	0.00046	0.02414	0.01207	0.54565	0.00836	0.01672	1.83266	3.20177	0.02104	0.00709	0.01349	0.04050	1.61143	1.35284	1.63946	1.32609	0.03687	0.01580	0.42858
222	0.00658	0.09155	0.04578	0.32673	0.02561	0.05122	3.06064	4.39531	0.09542	0.00962	0.05353	0.18785	0.51719	1.45602	0.66495	1.34265	0.19685	0.04258	0.21631
223	0.00002	0.00538	0.00269	0.68722	0.00223	0.00446	1.45513	1.75312	0.00367	0.00184	0.00285	0.00712	1.04202	1.36176	1.04456	1.35666	0.00679	0.00426	0.62752
224	0.00011	0.01194	0.00597	0.79041	0.00470	0.00939	1.26517	2.39343	0.00839	0.00411	0.00624	0.01634	1.14265	1.36176	1.15539	1.36940	0.01613	0.00884	0.54793
225	0.00445	0.07525	0.03763	0.49209	0.02582	0.05163	2.03215	2.71317	0.07070	0.01985	0.04094	0.12124	1.33755	1.36430	1.45475	1.38978	0.12507	0.04528	0.36205
226	0.00399	0.07131	0.03565	0.52151	0.02519	0.05037	1.91750	3.10776	0.06626	0.01373	0.03995	0.12297	1.77831	1.38214	1.83818	1.48787	0.12711	0.04000	0.31470
227	0.00184	0.04840	0.02420	0.47362	0.01608	0.03217	2.11138	1.71858	0.03267	0.00375	0.02358	0.06128	0.30063	1.38341	0.32483	1.43819	0.06839	0.03426	0.50090
228	0.00023	0.01725	0.00862	0.87705	0.00748	0.01496	1.14019	1.71849	0.01106	0.00670	0.00877	0.02094	1.90951	1.38723	1.92608	1.39742	0.02042	0.01457	0.71363
229	0.00058	0.02716	0.01358	0.56331	0.00961	0.01922	1.77523	2.15486	0.02176	0.00976	0.01437	0.03760	1.94773	1.41271	1.98212	1.40125	0.03716	0.01985	0.53409
230	0.00414	0.07261	0.03631	0.58596	0.02722	0.05443	1.70661	2.11531	0.05600	0.00836	0.03703	0.10342	2.06377	1.49042	0.25350	1.39997	0.11169	0.04721	0.42267
231	0.00123	0.03963	0.01981	0.52418	0.01376	0.02751	1.90774	3.79144	0.03760	0.00953	0.02282	0.07400	0.36560	1.40379	0.43693	1.41781	0.07659	0.02050	0.26767
232	0.00060	0.02772	0.01386	0.49061	0.00914	0.01828	2.03827	3.17994	0.02516	0.00611	0.01516	0.04653	1.31972	1.40634	1.32736	1.45093	0.04722	0.01628	0.34469
233	0.00282	0.05989	0.02994	0.65336	0.02362	0.04724	1.53056	1.90222	0.04105	0.02028	0.03082	0.08060	1.58341	1.46749	1.64583	1.41908	0.07684	0.04668	0.60748
234	0.00547	0.08346	0.04173	0.38400	0.02526	0.05052	2.60415	5.02316	0.10294	0.01706	0.05332	0.18271	2.58593	1.41016	2.59995	1.59105	0.18672	0.03730	0.19977
235	0.00845	0.10375	0.05188	0.33288	0.02934	0.05868	3.00412	3.44890	0.11194	0.00144	0.05665	0.18888	0.00764	1.41526	0.08790	1.58468	0.20403	0.05276	0.25857
236	0.00051	0.02539	0.01269	0.65401	0.00970	0.01940	1.52903	2.56982	0.01971	0.00498	0.01352	0.03845	1.73754	1.41781	1.75410	1.45093	0.04107	0.01570	0.38220
237	0.00259	0.05748	0.02874	0.68615	0.02323	0.04645	1.45741	2.06632	0.04249	0.02208	0.02977	0.08061	2.19104	1.47640	2.26237	1.44201	0.07553	0.04374	0.57905
238	0.00203	0.05084	0.02542	0.76725	0.02170	0.04340	1.30336	1.82257	0.03397	0.01657	0.02615	0.06688	0.59234	1.49806	0.64330	1.45729	0.06790	0.03807	0.56069
239	0.00335	0.06533	0.03267	0.46388	0.02167	0.04335	2.15573	3.94041	0.06569	0.01124	0.03874	0.12634	1.12864	1.51207	1.24329	1.46239	0.13450	0.03174	0.23597
240	0.01662	0.14545	0.07273	0.59205	0.05537	0.11074	1.68905	2.02015	0.10686	0.04658	0.07521	0.20456	1.38086	1.62799	1.50825	1.47003	0.19430	0.10889	0.56043
241	0.00086	0.03303	0.01651	0.51283	0.01125	0.02250	1.94997	2.85734	0.03302	0.00986	0.01875	0.05312	0.27133	1.50188	0.30700	1.46494	0.04963	0.02198	0.44287
242	0.00497	0.07955	0.03978	0.58419	0.02983	0.05966	1.71177	2.29198	0.06190	0.01693	0.04114	0.11816	0.87642	1.57194	0.91336	1.46112	0.11213	0.05644	0.50332
243	0.01851	0.15352	0.07676	0.21177	0.03476	0.06951	4.72204	4.40751	0.16919	0.02003	0.09386	0.31713	1.55268	1.49424	0.66750	1.55029	0.36759	0.06411	0.17442
244	0.00042	0.02309	0.01154	0.53355	0.00785	0.01570	1.87424	3.79822	0.02191	0.00516	0.01336	0.04188	1.31335	1.47003	1.35029	1.48659	0.04291	0.01242	0.28956
245	0.00166	0.04595	0.02298	0.87175	0.02086	0.04172	1.14712	1.59048	0.02994	0.01839	0.02327	0.05636	2.44581	1.51462	2.47766	1.47003	0.05349	0.03947	0.73791
246	0.00106	0.03667	0.01834	0.77472	0.01557	0.03113	1.29080	1.97920	0.02548	0.01147	0.01891	0.04976	1.03565	1.52354	1.07386	1.49424	0.05010	0.02685	0.53582
247	0.01033	0.11469	0.05734	0.36448	0.03405	0.06810	2.74365	2.04052	0.08743	0.01462	0.05821	0.16113	2.25600	1.54137	2.41524	1.55538	0.17397	0.07561	0.43461
248	0.00569	0.08512	0.04256	0.43112	0.02738	0.05476	2.31954	2.50269	0.06763	0.02313	0.04521	0.13194	0.16688	1.52863	0.27770	1.59742	0.12835	0.05646	0.43987
249	0.00051	0.02539	0.01269	0.46708	0.00812	0.01623	2.14095	4.18923	0.02538	0.00823	0.01481	0.04861	0.81782	1.52990	0.85221	1.56175	0.04582	0.01407	0.30700
250	0.00287	0.06046	0.03023	0.27028	0.01514	0.03028	3.69983	2.51564	0.05017	0.00122	0.02944	0.09238	1.12354	1.59105	1.21017	1.56303	0.10222	0.03576	0.34979
251	0.00200	0.05043	0.02522	0.72767	0.02094	0.04189	1.37424	1.59092	0.03257	0.01907	0.02629	0.06193	2.03690	1.58468	2.09295	1.56175	0.06708	0.03792	0.56529
252	0.00051	0.02547	0.01274	0.56961	0.00908	0.01815	1.75557	3.50624	0.02569	0.00616	0.01452	0.04504	1.64837	1.57322	1.67895	1.54264	0.04552	0.01425	0.31305
253	0.00224	0.05340	0.02670	0.24230	0.01258	0.02516	4.12710	2.43953	0.04619	0.00382	0.02804	0.07983	2.18212	1.60634	2.25983	1.59487	0.10125	0.02816	0.27812
254	0.00051	0.02551	0.01276	0.79755	0.01079	0.02158	1.25385	1.79512	0.01691	0.00932	0.01310	0.03237	0.31592	1.55793	0.32611	1.58723	0.03365	0.01934	0.57489
255																			



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-25 23.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸点X	絶対最大長軸点Y	絶対最大長軸点X	絶対最大長軸点Y	楕円長軸	楕円短軸	楕円長短比
256	0.00390	0.07048	0.03524	0.44235	0.02288	0.04576	2.26065	3.33825	0.06641	0.00502	0.03937	0.12572	0.82928	1.60124	0.95157	1.57831	0.13440	0.03696	0.27495
257	0.00237	0.05489	0.02744	0.65418	0.02162	0.04324	1.52863	2.16645	0.04234	0.01354	0.02862	0.07869	1.20634	1.63054	1.28023	1.60761	0.07831	0.03847	0.49117
258	0.00474	0.07765	0.03882	0.19474	0.01657	0.03314	5.13495	5.43149	0.10356	0.00127	0.05477	0.17502	0.62674	1.65984	0.78724	1.59360	0.20362	0.02961	0.14541
259	0.00004	0.00704	0.00352	0.75398	0.00306	0.00611	1.32629	1.60221	0.00446	0.00269	0.00366	0.00891	1.88786	1.59232	1.89423	1.59615	0.00870	0.00570	0.65504
260	0.00064	0.02857	0.01428	0.85996	0.01267	0.02534	1.16285	1.69864	0.01856	0.01058	0.01453	0.03562	0.50317	1.59487	0.51209	1.62799	0.03556	0.02295	0.64533
261	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.98342	1.59615	0.98597	1.59869	0.00424	0.00424	1.00000
262	0.00147	0.04319	0.02160	0.22113	0.00956	0.01911	4.52230	10.62522	0.06938	0.00621	0.03465	0.13248	0.00764	1.60124	0.00764	1.73245	0.13090	0.01425	0.10889
263	0.00000	0.00203	0.00102	0.69813	0.00085	0.00170	1.43239	1.57080	0.00127	0.00127	0.00127	0.00255	1.78340	1.60888	1.78468	1.60888	0.00192	0.00192	1.00000
264	0.00077	0.03129	0.01565	0.62907	0.01184	0.02368	1.58965	2.87696	0.02581	0.01115	0.01708	0.05064	0.91463	1.62672	0.95667	1.65220	0.04786	0.02046	0.42756
265	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	2.34263	1.62799	2.34645	1.63054	0.00519	0.00477	0.91906
266	0.00018	0.01521	0.00761	0.33444	0.00384	0.00769	2.99007	4.17312	0.01454	0.00129	0.00898	0.02715	1.56939	1.63818	1.59360	1.64710	0.02877	0.00804	0.27951
267	0.00002	0.00518	0.00259	0.33753	0.00151	0.00301	2.96273	4.97010	0.00673	0.00129	0.00352	0.01155	2.36301	1.63181	2.36173	1.64200	0.01287	0.00209	0.16224
268	0.00024	0.01731	0.00865	0.59924	0.00612	0.01224	1.66877	3.31557	0.01459	0.00310	0.00954	0.02879	0.50063	1.65347	0.52483	1.66621	0.02929	0.01023	0.34923
269	0.00370	0.06863	0.03432	0.78067	0.02975	0.05951	1.28095	1.44108	0.04260	0.02932	0.03470	0.08085	2.47383	1.67003	2.54772	1.69933	0.07982	0.05902	0.73934
270	0.00123	0.03957	0.01979	0.77987	0.01689	0.03378	1.28227	1.85553	0.02722	0.01448	0.02027	0.05210	2.01270	1.67130	2.06110	1.68659	0.05041	0.03107	0.61629
271	0.01696	0.14697	0.07348	0.34477	0.04257	0.08514	2.90051	3.21060	0.14197	0.03408	0.08119	0.25981	0.95794	1.66239	1.18342	1.78850	0.28977	0.07454	0.25723
272	0.00048	0.02465	0.01232	0.82730	0.01064	0.02128	1.20875	1.91529	0.01718	0.00899	0.01280	0.03238	2.32607	1.68659	2.34900	1.66621	0.03103	0.01958	0.63084
273	0.00027	0.01841	0.00920	0.73918	0.00734	0.01467	1.35284	2.23427	0.01413	0.00586	0.00968	0.02551	0.22165	1.67003	0.22929	1.69296	0.02598	0.01304	0.50200
274	0.00041	0.02277	0.01139	0.23477	0.00495	0.00990	4.25952	7.89601	0.03062	0.00119	0.01674	0.05741	0.76814	1.70188	0.81654	1.67385	0.06899	0.00752	0.10895
275	0.01090	0.11781	0.05890	0.14306	0.02171	0.04341	6.99032	5.21652	0.14278	0.02315	0.07516	0.26216	1.35029	1.69041	1.58978	1.79359	0.25416	0.05460	0.21484
276	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.08153	1.68404	0.08662	1.68914	0.00757	0.00683	0.90212
277	0.00086	0.03309	0.01655	0.39066	0.00977	0.01954	2.55980	4.92555	0.03814	0.00354	0.02027	0.06938	2.39740	1.72353	2.45345	1.68532	0.06868	0.01594	0.23217
278	0.00044	0.02366	0.01183	0.39311	0.00688	0.01376	2.54381	5.19013	0.02887	0.00414	0.01517	0.04999	0.30827	1.73500	0.34776	1.70697	0.05066	0.01105	0.21814
279	0.00178	0.04754	0.02377	0.37426	0.01399	0.02799	2.67191	3.41602	0.04416	0.00224	0.02600	0.08456	2.10314	1.70825	2.17320	1.75283	0.09069	0.02492	0.27483
280	0.00135	0.04146	0.02073	0.80701	0.01804	0.03609	1.23915	1.58492	0.02546	0.01669	0.02114	0.05057	0.15668	1.75410	0.17452	1.70825	0.05016	0.03427	0.68322
281	0.00018	0.01528	0.00764	0.91358	0.00671	0.01343	1.09459	1.80115	0.00980	0.00672	0.00777	0.01885	1.99741	1.72226	2.01015	1.71079	0.01702	0.01372	0.80590
282	0.00164	0.04570	0.02285	0.62895	0.01754	0.03509	1.58996	2.17720	0.03632	0.01626	0.02549	0.06529	2.19613	1.71079	2.23435	1.76175	0.07598	0.02749	0.36186
283	0.00129	0.04060	0.02030	0.52751	0.01418	0.02835	1.89568	1.92556	0.02887	0.00476	0.02043	0.05417	0.58215	1.72481	0.63311	1.73882	0.05967	0.02763	0.46299
284	0.00225	0.05353	0.02677	0.76692	0.02285	0.04569	1.30391	1.87826	0.03698	0.01878	0.02726	0.07150	1.94264	1.72608	1.97448	1.78850	0.06799	0.04215	0.61993
285	0.00432	0.07415	0.03707	0.39040	0.02262	0.04523	2.56149	2.57013	0.06944	0.01676	0.04093	0.11606	2.38594	1.75920	2.49931	1.74137	0.13056	0.04211	0.32251
286	0.00017	0.01452	0.00726	0.36350	0.00384	0.00768	2.75104	6.17111	0.01763	0.00177	0.00947	0.03164	0.70699	1.73117	0.73374	1.74519	0.03372	0.00625	0.18533
287	0.00021	0.01633	0.00816	0.79244	0.00666	0.01333	1.26193	2.14960	0.01143	0.00534	0.00849	0.02195	0.88915	1.74137	0.90826	1.73372	0.02258	0.01180	0.52259
288	0.00053	0.02607	0.01304	0.77247	0.01089	0.02177	1.29456	2.55503	0.02000	0.00968	0.01389	0.03960	0.39872	1.76175	0.42674	1.73627	0.03632	0.01871	0.51525
289	0.00047	0.02452	0.01226	0.74087	0.00998	0.01997	1.34976	1.94837	0.01887	0.00886	0.01275	0.03238	2.01015	1.75028	2.03053	1.77321	0.03167	0.01899	0.59954
290	0.00045	0.02388	0.01194	0.80209	0.01011	0.02021	1.24674	1.87112	0.01634	0.00922	0.01230	0.03087	0.55413	1.74646	0.57833	1.76302	0.02920	0.01953	0.66891
291	0.00095	0.03486	0.01743	0.64237	0.01340	0.02680	1.55674	2.53887	0.02759	0.00790	0.01853	0.05327	0.91845	1.75028	0.94011	1.79742	0.05344	0.02273	0.42534
292	0.00064	0.02853	0.01427	0.84040	0.01249	0.02498	1.89991	1.86736	0.01932	0.01158	0.01456	0.03724	1.78340	1.75156	1.81270	1.77194	0.03397	0.02396	0.70533
293	0.00663	0.09190	0.04595	0.50981	0.03225	0.06450	1.96150	3.08591	0.08318	0.02273	0.05130	0.15870	1.34010	1.75920	1.45729	1.86366	0.15057	0.05609	0.37253
294	0.00031	0.01976	0.00988	0.76299	0.00808	0.01615	1.31063	2.74952	0.01538	0.00672	0.01071	0.03066	0.98724	1.78340	1.01017	1.76557	0.02866	0.01363	0.47546
295	0.00484	0.07849	0.03925	0.66348	0.03140	0.06279	1.50719	1.70645	0.05748	0.02393	0.04061	0.10071	2.26237	1.77321	2.32225	1.85219	0.10428	0.05908	0.56656
296	0.00074	0.03076	0.01538	0.68528	0.01215	0.02430	1.45926	2.49076	0.02527	0.00908	0.01638	0.04632	0.00764	1.77321	0.01401	1.81780	0.04522	0.02093	0.46280
297	0.00409	0.07213	0.03606	0.55261	0.02624	0.05247	1.80959	1.89380	0.05778	0.00921	0.03695	0.09714	0.35668	1.83181	0.44203	1.78850	0.10692	0.04866	0.45507
298	0.00108	0.03704	0.01852	0.51493	0.01273	0.02545	1.94199	3.34363	0.03369	0.00803	0.02098	0.06486	1.47895	1.78595	1.52099	1.83308	0.06656	0.02061	0.30969
299	0.00140	0.04220	0.02110	0.67052	0.01672	0.03345	1.49139	2.24785	0.03455	0.01175	0.02221	0.06124	0.73629	1.82162	0.78597	1.78850	0.06270	0.02840	0.45297
300	0.00520	0.08137	0.04069	0.58177	0.03047	0.06093	1.71888	3.14924	0.07412	0.02056	0.04558	0.14177	1.66493	1.85729	1.78722	1.78850	0.14142	0.04683	0.33111
301	0.00201	0.05055	0.02528	0.59292	0.01889	0.03778	1.68656	2.25565	0.03972	0.01288	0.02680	0.07368	1.80761	1.78722	1.84964	1.84582	0.07848	0.03257	0.41496
302	0.00007	0.00943	0.00471	0.81273	0.00367	0.00733	1.23043	2.76462	0.00707	0.00312	0.00501	0.01352	0.33563	1.78722	2.04200	1.79742	0.01296	0.00686	0.52920
303	0.00921	0.10828	0.05414	0.50845	0.03802	0.07604	1.96675	2.26515	0.08291	0.01713	0.05634	0.16050	0.93501	1.92735	1.05348	1.82162	0.17153	0.06835	0.39849
304	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	0.50954	1.81652	0.51337	1.82034	0.00572	0.00572	1.00000
305	0.00058	0.02712	0.01356	0.74402	0.01113	0.02227	1.34404	2.29012	0.02023	0.00981	0.01416	0.03906	0.13885	1.84582	0.17197	1.82799	0.03569	0.02061	0.5



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-25 23.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長始点X	絶対最大長始点Y	絶対最大長終点X	絶対最大長終点Y	楕円長軸	楕円短軸	楕円長短比
307	0.00394	0.07078	0.03539	0.45202	0.02324	0.04648	2.21228	3.71895	0.06778	0.01311	0.04075	0.13331	0.52228	1.93117	0.61782	1.84073	0.14154	0.03540	0.25008
308	0.00000	0.00203	0.00102	0.69813	0.00085	0.00170	1.43239	1.57080	0.00127	0.00127	0.00127	0.00255	1.53118	1.83818	1.53118	1.83945	0.00192	0.00192	1.00000
309	0.00322	0.06404	0.03202	0.31991	0.01753	0.03506	3.12588	2.91333	0.05688	0.00267	0.03402	0.10581	1.97193	1.86620	2.05728	1.92608	0.12203	0.03361	0.27541
310	0.00281	0.05982	0.02991	0.67532	0.02399	0.04799	1.48077	1.48419	0.03704	0.01863	0.03003	0.07114	2.07766	1.87894	2.12607	1.92862	0.07108	0.05035	0.70835
311	0.00162	0.04536	0.02268	0.57461	0.01658	0.03317	1.74032	2.94314	0.04134	0.01074	0.02524	0.07506	2.29549	1.94773	2.31842	1.87767	0.08006	0.02570	0.32105
312	0.00500	0.07979	0.03989	0.69003	0.03256	0.06511	1.44921	2.02240	0.06630	0.02703	0.04182	0.11148	1.17450	1.94773	1.28278	1.92735	0.10695	0.05952	0.55651
313	0.00004	0.00689	0.00345	0.59716	0.00266	0.00533	1.67459	2.01608	0.00532	0.00212	0.00360	0.00979	2.35282	1.88531	2.35919	1.89041	0.00881	0.00539	0.61238
314	0.00140	0.04220	0.02110	0.69690	0.01703	0.03406	1.43493	1.89386	0.03009	0.01196	0.02169	0.05614	0.73756	1.91588	0.78597	1.89041	0.05817	0.03062	0.52634
315	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	1.79742	1.88786	1.79996	1.89041	0.00424	0.00424	1.00000
316	0.00338	0.06559	0.03279	0.64153	0.02570	0.05140	1.55878	2.39314	0.05301	0.02022	0.03485	0.09927	1.46239	1.94136	1.55793	1.91971	0.09909	0.04341	0.43806
317	0.00003	0.00643	0.00321	0.51927	0.00232	0.00463	1.92577	2.31850	0.00512	0.00153	0.00343	0.00979	2.36556	1.89295	2.37065	1.89932	0.00942	0.00439	0.46591
318	0.00340	0.06582	0.03291	0.58992	0.02468	0.04936	1.69515	3.11862	0.06090	0.01739	0.03637	0.11349	0.08153	1.94773	0.18981	1.91843	0.11202	0.03868	0.34528
319	0.00072	0.03032	0.01516	0.23286	0.00677	0.01353	4.29434	4.30337	0.03243	0.00563	0.01817	0.05816	1.34010	1.94773	1.39360	1.92862	0.06626	0.01388	0.20940
320	0.00058	0.02716	0.01358	0.39626	0.00797	0.01593	2.52361	4.97126	0.03099	0.00394	0.01665	0.05643	0.20254	1.94136	0.25732	1.94773	0.05767	0.01279	0.22177
321	0.00018	0.01528	0.00764	0.77929	0.00613	0.01227	1.28322	2.12375	0.01058	0.00514	0.00793	0.02026	2.45345	1.93881	2.47001	1.94773	0.02066	0.01130	0.54711
322	0.00030	0.01939	0.00970	0.50325	0.00629	0.01257	1.98709	4.34553	0.01897	0.00460	0.01111	0.03694	1.41144	1.94773	1.44710	1.94773	0.03527	0.01066	0.30230
323	0.00007	0.00964	0.00482	0.34424	0.00227	0.00454	2.90494	6.59104	0.01259	0.00246	0.00632	0.01987	0.44712	1.94264	0.46496	1.94773	0.01952	0.00476	0.24394
324	0.00002	0.00498	0.00249	0.58905	0.00191	0.00382	1.69765	2.45044	0.00390	0.00180	0.00279	0.00779	2.03308	1.94646	2.03945	1.94773	0.00860	0.00288	0.33550



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-29 14.1m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾点x	絶対最大長傾点y	絶対最大長傾点x	絶対最大長傾点y	楕円長軸	楕円短軸	楕円長短比
1	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.22293	0.00382	0.22802	0.00892	0.00757	0.00683	0.90212
2	0.00001	0.00321	0.00161	0.43633	0.00106	0.00212	2.29183	3.92699	0.00318	0.00064	0.00191	0.00637	0.23312	0.00382	0.23821	0.00382	0.00706	0.00146	0.20751
3	0.00006	0.00874	0.00437	0.26991	0.00171	0.00342	3.70493	9.74459	0.01152	0.00144	0.00591	0.02056	0.31464	0.00382	0.33375	0.00637	0.02305	0.00332	0.14394
4	0.00148	0.04341	0.02170	0.64667	0.01686	0.03373	1.54638	1.71428	0.03045	0.01596	0.02228	0.05492	0.41018	0.02038	0.46114	0.00382	0.05471	0.03444	0.62949
5	0.00207	0.05135	0.02567	0.28422	0.01309	0.02618	3.51841	4.88518	0.06993	0.00963	0.03475	0.10855	0.78979	0.00382	0.89680	0.01146	0.11222	0.02349	0.20936
6	0.00299	0.06171	0.03085	0.34454	0.01751	0.03503	2.90243	5.07054	0.07703	0.01241	0.04044	0.13437	0.29292	0.00382	1.06240	0.01656	0.13609	0.02798	0.20561
7	0.00001	0.00321	0.00161	0.43633	0.00106	0.00212	2.29183	3.92699	0.00318	0.00064	0.00191	0.00637	1.09934	0.00382	1.10444	0.00382	0.00706	0.00146	0.20751
8	0.00594	0.08695	0.04347	0.42786	0.02785	0.05570	2.33721	2.60840	0.08027	0.02266	0.04754	0.13752	1.49296	0.00382	1.57831	0.10955	0.13595	0.05561	0.40902
9	0.00245	0.05582	0.02791	0.47042	0.01854	0.03708	2.12576	2.57571	0.04889	0.01769	0.03006	0.08678	1.64455	0.00892	1.72990	0.00382	0.08350	0.03731	0.44688
10	0.00004	0.00733	0.00366	0.15441	0.00144	0.00288	6.47638	13.35487	0.01534	0.00133	0.00730	0.02678	1.97193	0.00510	1.99741	0.00382	0.03222	0.00167	0.05174
11	0.00651	0.09107	0.04553	0.47135	0.03066	0.06131	2.12158	2.76584	0.08745	0.01448	0.04967	0.14852	2.06110	0.05605	2.19868	0.00382	0.15724	0.05274	0.33543
12	0.00021	0.01620	0.00810	0.61010	0.00577	0.01153	1.63906	3.33727	0.01373	0.00499	0.00896	0.02687	2.39486	0.00382	2.41396	0.02038	0.02574	0.01019	0.96032
13	0.00259	0.05748	0.02874	0.45963	0.01891	0.03781	2.17565	2.16179	0.04621	0.01586	0.03003	0.08200	0.23949	0.02930	0.29299	0.08917	0.07913	0.04175	0.52756
14	0.00511	0.08064	0.04032	0.64051	0.03168	0.06336	1.56125	1.74115	0.05614	0.02614	0.04087	0.10447	1.93372	0.09427	2.00760	0.02293	0.09964	0.06525	0.65489
15	0.00005	0.00800	0.00400	0.84117	0.00309	0.00618	1.18882	2.96408	0.00588	0.00260	0.00428	0.01161	1.14265	0.02802	1.14902	0.02038	0.01088	0.00589	0.54076
16	0.01098	0.11822	0.05911	0.28679	0.03106	0.06212	3.48687	2.60318	0.09659	0.00289	0.05934	0.18717	0.66750	0.02166	0.70444	0.20382	0.20401	0.06850	0.33579
17	0.00017	0.01459	0.00729	0.64764	0.00529	0.01057	1.54407	2.50506	0.01093	0.00317	0.00765	0.02079	2.30059	0.03312	2.30823	0.05095	0.02187	0.00973	0.44504
18	0.00005	0.00826	0.00413	0.97436	0.00348	0.00695	1.02632	2.35619	0.00541	0.00370	0.00426	0.01081	0.42674	0.05223	0.43311	0.04586	0.00905	0.00753	0.83244
19	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	1.12482	0.05095	1.12737	0.05478	0.00519	0.00477	0.91906
20	0.00159	0.04504	0.02252	0.55821	0.01625	0.03250	1.79145	2.85003	0.03844	0.01015	0.02419	0.07344	0.13630	0.11210	0.17961	0.05478	0.07629	0.02660	0.34861
21	0.00186	0.04862	0.02431	0.46562	0.01601	0.03202	2.14765	3.78079	0.05141	0.01231	0.02842	0.09125	1.82417	0.06242	1.91206	0.08153	0.09194	0.02571	0.27962
22	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	1.11463	0.06115	1.11845	0.06497	0.00572	0.00572	1.00000
23	0.02412	0.17526	0.08763	0.37840	0.05333	0.10665	2.64270	2.59098	0.14257	0.03078	0.09037	0.27907	2.32225	0.33120	2.38721	0.06115	0.27582	0.11136	0.40373
24	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	1.10316	0.06242	1.10698	0.06624	0.00572	0.00572	1.00000
25	0.00003	0.00627	0.00313	0.73692	0.00269	0.00538	1.35701	1.61472	0.00400	0.00245	0.00325	0.00796	1.35029	0.07134	1.35411	0.06624	0.00687	0.00572	0.83266
26	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	1.09807	0.07261	1.10189	0.07771	0.00712	0.00580	0.81492
27	0.00691	0.09377	0.04689	0.43786	0.03044	0.06089	2.28384	1.93331	0.06770	0.01743	0.04676	0.12794	0.91718	0.16305	1.03565	0.11847	0.13502	0.06513	0.48235
28	0.00079	0.03166	0.01583	0.61662	0.01184	0.02369	1.62174	2.22288	0.02472	0.01180	0.01665	0.04498	0.22420	0.11210	0.26114	0.08917	0.04155	0.02412	0.58043
29	0.00144	0.04288	0.02144	0.56516	0.01554	0.03108	1.76941	2.66591	0.03490	0.00908	0.02318	0.06751	1.62927	0.08662	1.65729	0.14649	0.07253	0.02535	0.34952
30	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	1.22673	0.08917	1.22927	0.09299	0.00519	0.00477	0.91906
31	0.00146	0.04312	0.02156	0.60816	0.01624	0.03248	1.64430	2.08385	0.03431	0.01158	0.02257	0.06012	1.74137	0.09172	1.76557	0.14522	0.06161	0.03018	0.48996
32	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	1.14902	0.09172	1.15157	0.09427	0.00424	0.00424	1.00000
33	0.00074	0.03080	0.01540	0.58383	0.01118	0.02236	1.71283	2.36231	0.02482	0.00668	0.01634	0.04498	1.84073	0.13376	1.86366	0.09681	0.04741	0.02000	0.42187
34	0.00328	0.06467	0.03233	0.52514	0.02284	0.04569	1.90424	2.59831	0.05271	0.01562	0.03424	0.10163	0.57578	0.09936	0.58980	0.19872	0.10440	0.04006	0.38367
35	0.00004	0.00704	0.00352	0.75398	0.00306	0.00611	1.32629	1.63625	0.00447	0.00308	0.00364	0.00901	0.16815	0.10573	0.17324	0.10063	0.00704	0.00704	1.00000
36	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	1.82417	0.11083	1.82799	0.11337	0.00519	0.00477	0.91906
37	0.00105	0.03651	0.01825	0.75071	0.01525	0.03049	1.33208	1.89746	0.02501	0.01324	0.01890	0.04848	1.56303	0.16178	1.57831	0.11720	0.04697	0.02837	0.60413
38	0.00467	0.07713	0.03856	0.48147	0.02617	0.05233	2.07699	1.83994	0.05650	0.02373	0.03912	0.10230	1.31972	0.19872	1.40889	0.15159	0.10352	0.05746	0.55508
39	0.00084	0.03268	0.01634	0.44811	0.01038	0.02076	2.23162	3.34639	0.03007	0.00907	0.01799	0.05673	0.02293	0.13758	0.05987	0.17834	0.05387	0.01983	0.36809
40	0.00022	0.01689	0.00844	0.66750	0.00632	0.01265	1.49812	2.83695	0.01423	0.00335	0.00905	0.02608	0.86750	0.14649	0.88406	0.16433	0.02638	0.01081	0.40981
41	0.00568	0.08505	0.04252	0.50999	0.02981	0.05962	1.96081	2.72922	0.07595	0.01992	0.04594	0.13791	1.49424	0.15032	1.57704	0.25859	0.13384	0.05405	0.40380
42	0.00046	0.02414	0.01207	0.28902	0.00592	0.01183	3.45991	6.48414	0.03088	0.00277	0.01542	0.05605	2.60377	0.14904	2.60377	0.20382	0.05245	0.01111	0.21178
43	0.00014	0.01356	0.00678	0.64462	0.00484	0.00969	1.55130	3.30825	0.01114	0.00402	0.00738	0.02195	0.73756	0.16942	0.74521	0.15032	0.02142	0.00859	0.40082
44	0.00017	0.01473	0.00736	0.74290	0.00576	0.01152	1.34607	2.04289	0.01059	0.00520	0.00764	0.01911	0.06497	0.15286	0.07134	0.16942	0.01934	0.01121	0.57973
45	0.00237	0.05489	0.02744	0.39496	0.01665	0.03331	2.53193	3.25599	0.05149	0.01035	0.03045	0.09563	0.15032	0.15286	0.22165	0.21401	0.09236	0.03261	0.35311
46	0.00104	0.03631	0.01815	0.57062	0.01315	0.02630	1.75249	3.01058	0.03172	0.01050	0.01989	0.06040	0.12102	0.17961	0.15923	0.22420	0.05826	0.02263	0.38838
47	0.00006	0.00850	0.00425	0.95087	0.00357	0.00715	1.05167	2.50807	0.00585	0.00315	0.00447	0.01161	0.35795	0.19617	0.36432	0.18853	0.01031	0.00702	0.68090
48	0.00392	0.07068	0.03534	0.51048	0.02467	0.04934	1.95894	1.98394	0.05107	0.02022	0.03621	0.09727	2.51715	0.26878	2.58339	0.20000	0.09828	0.05083	0.51718
49	0.01289	0.12812	0.06406	0.45819	0.04279	0.08557	2.18249	2.32762	0.10457	0.03076	0.06669	0.19287	1.08278	0.38088	1.09679	0.18981	0.18572	0.08839	0.47593
50	0.00844	0.10365	0.05183	0.41983	0.03301	0.06602	2.38190	2.94041	0.09465	0.02307	0.05636	0.17471	1.14902	0.20000	1.28405	0.30827	0.17656	0.06085	0.34466
51	0.00240	0.05530	0.02765	0.															



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-29 14.1m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸X	絶対最大長軸Y	絶対最大長軸X	絶対最大長軸Y	楕円長軸	楕円短軸	楕円長短比
52	0.00086	0.03300	0.01650	0.37363	0.00951	0.01902	2.67647	4.36558	0.03837	0.00639	0.02008	0.06501	0.39872	0.22675	0.46114	0.21401	0.06223	0.01750	0.28121
53	0.00003	0.00643	0.00321	0.32057	0.00182	0.00364	3.11944	3.79556	0.00626	0.00180	0.00406	0.01252	1.13628	0.20382	1.14265	0.19490	0.01495	0.00276	0.18494
54	0.00930	0.10883	0.05442	0.69638	0.04484	0.08968	1.43600	1.58756	0.07537	0.03682	0.05481	0.13540	1.27259	0.23694	1.40252	0.27006	0.13139	0.09015	0.68616
55	0.00004	0.00704	0.00352	0.62313	0.00278	0.00556	1.60481	2.00440	0.00504	0.00240	0.00374	0.00997	0.07388	0.22547	0.08153	0.22165	0.00993	0.00499	0.50250
56	0.01129	0.11991	0.05995	0.51901	0.04261	0.08523	1.92673	2.00301	0.08816	0.03760	0.06193	0.16743	0.00510	0.29554	0.16815	0.26369	0.16625	0.08649	0.52022
57	0.00085	0.03281	0.01640	0.58288	0.01193	0.02387	1.71562	1.91449	0.02341	0.00838	0.01679	0.04325	0.25477	0.27643	0.28152	0.24458	0.04561	0.02360	0.51744
58	0.00115	0.03827	0.01914	0.66106	0.01498	0.02996	1.51273	1.76077	0.02819	0.01097	0.01945	0.04889	2.03563	0.26369	2.07639	0.28789	0.05164	0.02836	0.54924
59	0.00143	0.04271	0.02136	0.54211	0.01513	0.03027	1.84463	2.01750	0.03117	0.01205	0.02218	0.05839	0.36178	0.31592	0.41273	0.29044	0.06129	0.02977	0.48567
60	0.00632	0.08968	0.04484	0.54815	0.03263	0.06525	1.82433	1.71653	0.06398	0.03211	0.04615	0.11547	2.39613	0.39617	2.41778	0.28407	0.11356	0.07083	0.62369
61	0.00157	0.04474	0.02237	0.69790	0.01811	0.03622	1.43287	1.67553	0.02822	0.01493	0.02258	0.05613	0.44076	0.33885	0.45732	0.28662	0.05323	0.03761	0.70648
62	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	2.21651	0.29044	2.21906	0.29299	0.00424	0.00424	1.00000
63	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	1.67512	0.29171	1.67895	0.29554	0.00572	0.00572	1.00000
64	0.00089	0.03365	0.01682	0.61046	0.01258	0.02516	1.63811	2.27572	0.02435	0.00803	0.01765	0.04858	0.22420	0.33375	0.27006	0.34522	0.04860	0.02330	0.47942
65	0.00819	0.10214	0.05107	0.32018	0.02832	0.05663	3.12326	2.69103	0.08333	0.00994	0.05345	0.16419	1.58978	0.48279	1.60888	0.32101	0.18103	0.05762	0.31831
66	0.01723	0.14814	0.07407	0.36444	0.04413	0.08826	2.74397	2.19215	0.11057	0.03587	0.07355	0.21645	1.19998	0.47378	1.36048	0.33120	0.21395	0.10257	0.47940
67	0.00608	0.08799	0.04399	0.58457	0.03306	0.06613	1.71066	2.10758	0.06498	0.02460	0.04559	0.12556	1.92862	0.39107	2.04837	0.35795	0.12528	0.06179	0.49323
68	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	1.75156	0.33502	1.75538	0.33885	0.00572	0.00572	1.00000
69	0.00004	0.00704	0.00352	0.75398	0.00306	0.00611	1.32629	1.60221	0.00446	0.00269	0.00366	0.00891	1.46876	0.34267	1.47258	0.34904	0.00870	0.00570	0.65504
70	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	1.70952	0.34649	1.71207	0.34904	0.00424	0.00424	1.00000
71	0.02287	0.17064	0.08532	0.51168	0.06044	0.12089	1.95434	2.46177	0.14804	0.04277	0.09186	0.26516	1.02418	0.34904	1.03437	0.61273	0.27509	0.10585	0.38477
72	0.06534	0.28843	0.14421	0.18075	0.06073	0.12146	5.53238	1.97967	0.22344	0.01501	0.13153	0.40195	2.02289	0.40509	2.32734	0.66495	0.47374	0.17560	0.37068
73	0.00376	0.06916	0.03458	0.55423	0.02516	0.05033	1.80431	2.44894	0.05553	0.01945	0.03569	0.10579	0.44458	0.46368	0.46114	0.36050	0.09956	0.04804	0.48256
74	0.00562	0.08462	0.04231	0.62298	0.03282	0.06564	1.60519	2.21171	0.06820	0.02771	0.04360	0.12367	2.47001	0.36432	2.51587	0.47770	0.11513	0.06220	0.54022
75	0.00152	0.04393	0.02196	0.68720	0.01762	0.03524	1.45518	2.02987	0.03393	0.01402	0.02289	0.06056	0.75030	0.37451	0.80890	0.38343	0.06124	0.03151	0.51460
76	0.02747	0.18701	0.09351	0.49871	0.06546	0.13092	2.00517	1.82381	0.13760	0.05272	0.09415	0.25036	1.65856	0.43948	1.89932	0.50317	0.25212	0.13872	0.55022
77	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.58470	0.37451	0.58725	0.37706	0.00424	0.00424	1.00000
78	0.00396	0.07097	0.03549	0.50170	0.02455	0.04910	1.99321	2.61396	0.05650	0.02117	0.03798	0.11207	0.10955	0.45349	0.20637	0.39999	0.10569	0.04766	0.45092
79	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	0.77323	0.40636	0.77833	0.41273	0.00889	0.00697	0.78403
80	0.00116	0.03849	0.01924	0.27692	0.00954	0.01908	3.61110	5.27354	0.04350	0.00493	0.02472	0.08324	0.00382	0.51591	0.02038	0.43566	0.08961	0.01653	0.18448
81	0.00363	0.06798	0.03399	0.49285	0.02330	0.04659	2.02902	2.87917	0.06303	0.01143	0.03696	0.11262	2.37575	0.45349	2.45727	0.52865	0.11574	0.03993	0.34502
82	0.00415	0.07267	0.03634	0.34254	0.02070	0.04140	2.91933	1.68349	0.05052	0.01309	0.03599	0.09177	0.88533	0.52228	0.93883	0.44967	0.10513	0.05023	0.47781
83	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.16051	0.45349	0.16305	0.45604	0.00424	0.00424	1.00000
84	0.01013	0.11356	0.05678	0.59566	0.04325	0.08650	1.67881	2.42755	0.09057	0.03321	0.06010	0.17461	1.24201	0.50317	1.41398	0.52483	0.16567	0.07784	0.46987
85	0.00111	0.03751	0.01876	0.54972	0.01334	0.02669	1.81911	3.34549	0.03696	0.00981	0.02100	0.06583	0.48152	0.47515	0.51719	0.52865	0.06579	0.02139	0.32503
86	0.00276	0.05932	0.02966	0.63380	0.02305	0.04609	1.57778	2.37282	0.04924	0.01508	0.03161	0.08919	1.62290	0.47770	1.66366	0.55540	0.08967	0.03924	0.43761
87	0.01523	0.13927	0.06964	0.63539	0.05492	0.10985	1.57383	2.08207	0.10476	0.04564	0.07281	0.19885	2.47256	0.51846	2.59867	0.67005	0.19249	0.10077	0.52350
88	0.00023	0.01701	0.00850	0.70826	0.00656	0.01311	1.41191	2.68633	0.01296	0.00449	0.00899	0.02554	1.94646	0.53775	1.96684	0.52483	0.02505	0.01155	0.46108
89	0.00691	0.09382	0.04691	0.34190	0.02685	0.05370	2.92483	2.37374	0.07552	0.00566	0.04491	0.14150	0.26369	0.67132	0.34394	0.55668	0.14915	0.05901	0.39563
90	0.00108	0.03704	0.01852	0.48777	0.01236	0.02471	2.05013	1.85042	0.02630	0.00891	0.01857	0.04813	0.16305	0.56942	0.18344	0.61145	0.04805	0.02855	0.59423
91	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.40254	0.56942	0.40509	0.57196	0.00424	0.00424	1.00000
92	0.01362	0.13171	0.06585	0.71296	0.05503	0.11007	1.40261	1.80563	0.09126	0.04480	0.06738	0.17516	1.14520	0.69680	1.29424	0.60763	0.17442	0.09946	0.57024
93	0.00431	0.07406	0.03703	0.65101	0.02929	0.05858	1.53607	1.58146	0.04633	0.02680	0.03732	0.09130	1.67895	0.63056	1.75283	0.57961	0.08725	0.06287	0.72058
94	0.01391	0.13306	0.06653	0.39687	0.04133	0.08265	2.51975	2.12060	0.10601	0.02650	0.06981	0.19105	2.07384	0.57961	2.09550	0.76814	0.19595	0.09035	0.46108
95	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.91208	0.58852	0.91463	0.59107	0.00424	0.00424	1.00000
96	0.00708	0.09493	0.04747	0.67222	0.03833	0.07667	1.48760	2.10860	0.07434	0.02625	0.04955	0.13578	0.66495	0.59617	0.77705	0.67005	0.13550	0.06651	0.49087
97	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	0.11847	0.59871	0.12229	0.60126	0.00519	0.00477	0.91906
98	0.00003	0.00610	0.00305	0.69813	0.00255	0.00510	1.43239	1.82212	0.00412	0.00214	0.00321	0.00823	0.11592	0.60636	0.11847	0.61273	0.00863	0.00431	0.49945
99	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	0.11465	0.62037	0.11720	0.62419	0.00519	0.00477	0.91906
100	0.00025	0.01795	0.00898	0.28672	0.00424	0.00848	3.48777	6.65480	0.02274	0.00291	0.01197	0.04087	1.75665	0.66368	1.77066	0.62674	0.04408	0.00731	0.16589
101	0.00988	0.11217	0.05609	0.69560	0.04620	0.09239	1.43760	1.43509	0.07632	0.04185	0.05734	0.13271	0.01783	0.75922	0.02548	0.62801	0.13858	0.09080	0.65520
102	0.00003	0.00659	0.00329	0.45815															



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-29 14.1m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長始点X	絶対最大長始点Y	絶対最大長終点X	絶対最大長終点Y	楕円長軸	楕円短軸	楕円長短比
103	0.00119	0.03894	0.01947	0.72201	0.01598	0.03197	1.38503	2.17991	0.02834	0.00987	0.02017	0.05554	0.43184	0.67642	0.48024	0.65222	0.05397	0.02810	0.52061
104	0.00185	0.04851	0.02426	0.66232	0.01916	0.03833	1.50985	1.75780	0.03328	0.01411	0.02489	0.06244	1.04711	0.66878	1.10316	0.69298	0.06288	0.03743	0.59520
105	0.00133	0.04119	0.02059	0.70989	0.01678	0.03356	1.40868	1.90818	0.02967	0.01542	0.02121	0.05503	0.94266	0.65731	0.96813	0.70444	0.05268	0.03220	0.61124
106	0.00588	0.08655	0.04328	0.32765	0.02418	0.04836	3.05202	2.20785	0.06599	0.01127	0.04031	0.12554	1.61271	0.65859	1.68149	0.76177	0.12154	0.06164	0.50716
107	0.00358	0.06751	0.03376	0.70318	0.02773	0.05547	1.42211	1.59157	0.04503	0.02593	0.03452	0.08345	1.32227	0.74139	1.33246	0.65986	0.07891	0.05776	0.73206
108	0.01600	0.14274	0.07137	0.64597	0.05680	0.11359	1.54806	1.77258	0.09848	0.04780	0.07155	0.18817	1.92735	0.67132	1.96302	0.85476	0.17793	0.11452	0.64360
109	0.00029	0.01928	0.00964	0.61073	0.00694	0.01387	1.63739	3.10668	0.01639	0.00589	0.01054	0.03129	2.48403	0.68024	2.51332	0.67387	0.03044	0.01222	0.40127
110	0.00025	0.01795	0.00898	0.57814	0.00624	0.01249	1.72968	2.57406	0.01451	0.00398	0.00938	0.02634	2.54517	0.67642	2.56937	0.68279	0.02728	0.01182	0.43321
111	0.00011	0.01168	0.00584	0.33695	0.00281	0.00563	2.96781	5.15203	0.01262	0.00153	0.00684	0.02201	2.38466	0.68024	2.39486	0.69807	0.02467	0.00553	0.22402
112	0.03458	0.20982	0.10491	0.28055	0.05499	0.10997	3.56441	2.24093	0.17033	0.04841	0.10847	0.31081	0.65986	0.99234	0.69935	0.68534	0.30089	0.14631	0.48626
113	0.00780	0.09966	0.04983	0.63127	0.03902	0.07803	1.58412	2.13610	0.07869	0.03026	0.05241	0.14354	0.88406	0.68916	0.92864	0.82419	0.14440	0.06878	0.47633
114	0.00014	0.01325	0.00663	0.77324	0.00523	0.01046	1.29325	2.27410	0.00916	0.00452	0.00696	0.01794	0.35541	0.70827	0.36178	0.69298	0.01805	0.00973	0.53897
115	0.03074	0.19783	0.09891	0.50844	0.06995	0.13990	1.96680	1.68834	0.13761	0.06264	0.10088	0.25494	2.30696	0.95157	2.34390	0.70062	0.25451	0.15377	0.60419
116	0.00300	0.06181	0.03090	0.31542	0.01679	0.03358	3.17038	5.25971	0.06993	0.01147	0.03990	0.13713	1.71844	0.78470	1.82671	0.70317	0.13693	0.02790	0.20376
117	0.00744	0.09735	0.04868	0.72466	0.04084	0.08168	1.37996	1.35491	0.05744	0.04044	0.04900	0.11169	0.12102	0.79489	0.19872	0.71718	0.11000	0.08615	0.78319
118	0.00314	0.06328	0.03164	0.33540	0.01773	0.03546	2.98153	1.87079	0.04714	0.01507	0.03271	0.08376	0.30827	0.71336	0.36432	0.77323	0.08770	0.04566	0.52064
119	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	1.36430	0.71591	1.36812	0.71846	0.00519	0.00477	0.91906
120	0.00115	0.03827	0.01914	0.34501	0.01068	0.02135	2.89849	3.42347	0.03518	0.00523	0.02247	0.06726	2.52861	0.75412	2.58466	0.71973	0.07321	0.02001	0.27330
121	0.00006	0.00874	0.00437	0.66721	0.00299	0.00599	1.49879	3.40261	0.00717	0.00245	0.00478	0.01352	1.38596	0.72483	1.39615	0.71846	0.01380	0.00554	0.40168
122	0.00003	0.00627	0.00313	0.73692	0.00269	0.00538	1.35701	1.61472	0.00400	0.00245	0.00325	0.00796	0.82801	0.72483	0.83310	0.72100	0.00687	0.00572	0.83266
123	0.00155	0.04437	0.02219	0.19281	0.00917	0.01834	5.18650	2.55493	0.03551	0.00194	0.02183	0.06675	1.35666	0.77068	1.40634	0.72865	0.07288	0.02702	0.37074
124	0.00558	0.08429	0.04215	0.62765	0.03281	0.06561	1.93925	2.03552	0.06542	0.02848	0.04363	0.11816	1.23564	0.79616	1.34647	0.75922	0.11134	0.06381	0.57313
125	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	1.43182	0.72610	1.43437	0.72865	0.00424	0.00424	1.00000
126	0.00261	0.05764	0.02882	0.34707	0.01641	0.03282	2.88127	4.11124	0.05793	0.01188	0.03341	0.11297	0.44840	0.76049	0.55540	0.72865	0.11042	0.03009	0.27247
127	0.01529	0.13951	0.06975	0.35229	0.04083	0.08165	2.83855	2.02603	0.11098	0.02664	0.06855	0.19582	1.42672	0.83310	1.60761	0.76177	0.17636	0.11036	0.62575
128	0.00183	0.04830	0.02415	0.72913	0.02002	0.04005	1.37151	1.67553	0.03142	0.01581	0.02451	0.06071	0.39999	0.75540	0.43566	0.80253	0.06035	0.03865	0.64043
129	0.00318	0.06359	0.03179	0.64538	0.02497	0.04995	1.54947	1.97831	0.04643	0.01685	0.03251	0.08745	1.11208	0.76304	1.14902	0.84075	0.08711	0.04642	0.53290
130	0.00334	0.06526	0.03263	0.50196	0.02254	0.04507	1.99219	3.42056	0.06148	0.01679	0.03697	0.11766	0.00637	0.88151	0.05987	0.77833	0.11166	0.03813	0.34151
131	0.01269	0.12711	0.06356	0.56186	0.04706	0.09412	1.77980	1.63922	0.08625	0.04409	0.06448	0.16076	1.97448	0.86495	2.13371	0.85603	0.15926	0.10145	0.63703
132	0.00956	0.11031	0.05515	0.75989	0.04751	0.09501	1.31598	1.31976	0.06554	0.04256	0.05540	0.12522	1.27131	0.82673	1.34137	0.92864	0.12523	0.09716	0.77589
133	0.00084	0.03265	0.01633	0.47524	0.01068	0.02136	2.10422	3.02772	0.02703	0.00941	0.01779	0.05390	0.42292	0.87387	0.44330	0.82546	0.04969	0.02145	0.43174
134	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	1.21781	0.82673	1.22036	0.82928	0.00424	0.00424	1.00000
135	0.00040	0.02250	0.01125	0.44485	0.00692	0.01384	2.24796	3.53661	0.02022	0.00462	0.01238	0.03903	0.22929	0.82801	0.24458	0.86240	0.03894	0.01300	0.33384
136	0.00043	0.02349	0.01174	0.58355	0.00839	0.01678	1.71366	3.05970	0.02175	0.00536	0.01287	0.03842	2.54135	0.84966	2.57702	0.83947	0.03910	0.01411	0.36089
137	0.00044	0.02375	0.01187	0.65533	0.00903	0.01806	1.52595	2.27834	0.01719	0.00682	0.01238	0.03368	2.44454	0.86240	2.47129	0.84457	0.03325	0.01697	0.51026
138	0.00408	0.07204	0.03602	0.55112	0.02616	0.05232	1.81447	1.96751	0.05140	0.01940	0.03637	0.09886	0.85858	0.90954	0.94520	0.86495	0.09612	0.05400	0.56177
139	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	0.29426	0.85858	0.29808	0.86368	0.00712	0.00580	0.81492
140	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.30573	0.86368	0.30827	0.86622	0.00424	0.00424	1.00000
141	0.00004	0.00733	0.00366	0.36303	0.00221	0.00442	2.75460	3.35366	0.00675	0.00129	0.00433	0.01342	0.30700	0.87514	0.31592	0.86750	0.01513	0.00355	0.23481
142	0.07094	0.30053	0.15027	0.26406	0.07664	0.15328	3.78695	1.85415	0.21309	0.11117	0.15159	0.40615	0.25222	0.98724	0.65604	1.01654	0.39246	0.23014	0.58640
143	0.00179	0.04769	0.02385	0.25270	0.01142	0.02283	3.95725	3.02523	0.03979	0.00258	0.02493	0.07900	1.91079	0.90062	1.98722	0.88661	0.08940	0.02545	0.28462
144	0.00007	0.00943	0.00471	0.76721	0.00356	0.00712	1.30342	2.57557	0.00692	0.00347	0.00504	0.01305	1.12227	0.88278	1.12482	0.89425	0.01324	0.00671	0.50705
145	0.00107	0.03687	0.01844	0.46883	0.01204	0.02409	2.13299	3.27932	0.03575	0.01157	0.02088	0.06371	2.60249	0.88278	2.60377	0.94520	0.05711	0.02381	0.41690
146	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	1.65092	0.88533	1.65347	0.88788	0.00424	0.00424	1.00000
147	0.00169	0.04644	0.02322	0.62297	0.01775	0.03550	1.60522	2.20683	0.03418	0.00975	0.02418	0.06681	1.57067	0.89425	1.63436	0.90954	0.06912	0.03121	0.45145
148	0.00118	0.03884	0.01942	0.50251	0.01318	0.02636	1.98999	3.05854	0.03449	0.00684	0.02169	0.06502	1.54519	0.95157	1.56303	0.89043	0.06891	0.02189	0.31764
149	0.00171	0.04664	0.02332	0.63127	0.01794	0.03588	1.58412	2.03517	0.03269	0.01672	0.02398	0.06442	1.41016	0.89425	1.44328	0.94775	0.06094	0.03570	0.58593
150	0.00042	0.02313	0.01157	0.22336	0.00489	0.00979	4.47703	5.33110	0.02463	0.00088	0.01386	0.04781	1.10316	0.93119	1.13246	0.89552	0.05535	0.00967	0.17466
151	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	1.09934	0.90954	1.10189	0.91336	0.00519	0.00477	0.91906
152	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	1.71971	0.91081	1.72226	0.91336	0.00424	0.00424	1.00



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-29 14.1m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸X	絶対最大長軸Y	絶対最大長軸傾斜	絶対最大長軸傾斜Y	楕円長軸	楕円短軸	楕円長短比
154	0.00794	0.10052	0.05026	0.47635	0.03411	0.06823	2.09929	3.17447	0.09574	0.02493	0.05660	0.17612	2.15155	1.05730	2.29040	0.95157	0.16813	0.06009	0.35743
155	0.00157	0.04465	0.02233	0.72193	0.01839	0.03678	1.38517	1.71932	0.03091	0.01523	0.02293	0.05676	2.05219	0.93501	2.10059	0.96176	0.05682	0.03509	0.61764
156	0.00242	0.05550	0.02775	0.67538	0.02221	0.04443	1.48065	2.31097	0.04329	0.01759	0.02928	0.08218	0.98215	0.94011	0.99234	1.02036	0.08240	0.03739	0.45370
157	0.01544	0.14021	0.07011	0.40138	0.04384	0.08769	2.49138	1.62050	0.09618	0.03232	0.06935	0.17619	1.08023	0.98469	1.24201	1.05093	0.17568	0.11190	0.63694
158	0.00269	0.05855	0.02927	0.65381	0.02309	0.04618	1.52950	1.99941	0.04098	0.01719	0.02996	0.08076	1.36303	0.96941	1.43946	0.99106	0.08163	0.04199	0.51443
159	0.00801	0.10102	0.05051	0.26013	0.02517	0.05035	3.84419	2.75138	0.09219	0.00186	0.04797	0.16373	0.00382	0.96813	0.05860	1.12100	0.15913	0.06413	0.40299
160	0.00971	0.11117	0.05559	0.40899	0.03496	0.06993	2.44504	1.90197	0.07575	0.02289	0.05491	0.15080	2.52988	1.11081	2.57829	0.96941	0.14875	0.08309	0.55855
161	0.00045	0.02384	0.01192	0.68960	0.00932	0.01865	1.45012	2.35278	0.01745	0.00738	0.01251	0.03444	1.79359	0.99871	1.81270	0.97195	0.03392	0.01675	0.49382
162	0.00487	0.07877	0.03938	0.55501	0.02877	0.05754	1.80177	2.65443	0.06473	0.01955	0.04285	0.12583	1.27131	0.97450	1.31972	1.08915	0.12521	0.04955	0.39577
163	0.00007	0.00943	0.00471	0.87068	0.00382	0.00765	1.14853	2.33573	0.00664	0.00346	0.00494	0.01252	0.76559	0.97832	0.77451	0.98469	0.01209	0.00735	0.60735
164	0.02155	0.16566	0.08283	0.59220	0.06317	0.12635	1.68862	1.82685	0.12252	0.04083	0.08465	0.22191	2.00123	1.03055	2.19995	1.12609	0.23348	0.11753	0.50340
165	0.00511	0.08064	0.04032	0.79581	0.03536	0.07073	1.25658	1.39554	0.04940	0.03174	0.04066	0.09366	1.75283	1.00380	1.81652	1.07004	0.09233	0.07042	0.76269
166	0.00192	0.04942	0.02471	0.59375	0.01845	0.03691	1.68421	2.02012	0.03632	0.01725	0.02534	0.06808	0.79361	1.05730	0.83310	1.00380	0.06243	0.03912	0.62664
167	0.00100	0.03573	0.01787	0.34568	0.00993	0.01986	2.89283	3.68236	0.03443	0.00219	0.01968	0.06483	0.60126	1.08533	0.63311	1.03055	0.07038	0.01814	0.25776
168	0.00157	0.04474	0.02237	0.61430	0.01697	0.03394	1.62787	2.43761	0.03778	0.01062	0.02372	0.06761	2.21651	1.03310	2.25346	1.08788	0.06985	0.02866	0.41037
169	0.00481	0.07824	0.03912	0.68442	0.03178	0.06357	1.46110	1.92345	0.05593	0.02890	0.04039	0.10656	0.78215	1.11081	0.87259	1.05730	0.09898	0.06185	0.62481
170	0.00046	0.02422	0.01211	0.47740	0.00780	0.01561	2.09468	3.21644	0.02326	0.00302	0.01333	0.04051	1.06749	1.06112	1.09679	1.08660	0.04424	0.01326	0.29984
171	0.00301	0.06187	0.03094	0.62256	0.02383	0.04765	1.60626	2.28332	0.04580	0.01808	0.03251	0.09126	1.38723	1.10571	1.47386	1.08151	0.09139	0.04189	0.45839
172	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.26369	1.06877	0.26624	1.07132	0.00424	0.00424	1.00000
173	0.00083	0.03246	0.01623	0.57062	0.01167	0.02334	1.75248	2.31830	0.02391	0.00788	0.01715	0.04704	1.81143	1.12737	1.82162	1.08278	0.04839	0.02177	0.44994
174	0.00602	0.08758	0.04379	0.44196	0.02854	0.05708	2.26267	2.02279	0.06766	0.00988	0.04504	0.12211	2.42161	1.08278	2.49167	1.18087	0.13111	0.05850	0.46617
175	0.00851	0.10412	0.05206	0.67633	0.04224	0.08449	1.47857	1.54591	0.06416	0.03963	0.05275	0.12773	1.49551	1.09425	1.52226	1.21781	0.12201	0.08886	0.72828
176	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.26240	1.09934	1.06495	1.10189	0.00424	0.00424	1.00000
177	0.00537	0.08272	0.04136	0.56466	0.03051	0.06101	1.77098	1.51288	0.05171	0.02138	0.04043	0.09987	1.01017	1.10444	1.03437	1.19998	0.10195	0.06712	0.65834
178	0.00309	0.06275	0.03138	0.53213	0.02231	0.04463	1.87924	2.16251	0.04676	0.01108	0.03308	0.08997	1.34392	1.19361	1.37195	1.10953	0.09736	0.04045	0.41546
179	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	1.07641	1.11081	1.08023	1.11335	0.00519	0.00477	0.91906
180	0.00559	0.08437	0.04218	0.68416	0.03430	0.06860	1.46165	1.47745	0.05748	0.02974	0.04296	0.10081	0.93756	1.12100	0.99234	1.20380	0.10331	0.06890	0.66691
181	0.00370	0.06866	0.03433	0.50573	0.02387	0.04773	1.97733	2.52064	0.05642	0.01488	0.03724	0.10656	0.70699	1.21271	0.76049	1.12227	0.11524	0.04091	0.35505
182	0.00284	0.06010	0.03005	0.58788	0.02245	0.04490	1.70104	2.18360	0.04711	0.01836	0.03129	0.08654	0.31592	1.13119	0.37197	1.19488	0.08579	0.04210	0.49075
183	0.00075	0.03086	0.01543	0.39948	0.00917	0.01834	2.50327	3.18312	0.02725	0.00775	0.01675	0.05177	1.13119	1.12609	1.14010	1.17577	0.05451	0.01747	0.32055
184	0.00109	0.03721	0.01860	0.66836	0.01464	0.02928	1.49619	1.76600	0.02516	0.01064	0.01905	0.04760	0.55413	1.17450	0.57578	1.13373	0.04945	0.02799	0.56615
185	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	1.42800	1.15284	1.43182	1.15666	0.00572	0.00572	1.00000
186	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	1.44201	1.15412	1.44456	1.15666	0.00424	0.00424	1.00000
187	0.01183	0.12273	0.06136	0.42086	0.03921	0.07841	2.37606	3.14212	0.11163	0.02767	0.06995	0.21425	0.03567	1.37067	0.04586	1.15794	0.22588	0.06668	0.29520
188	0.00043	0.02340	0.01170	0.81538	0.00996	0.01992	1.22642	1.86614	0.01550	0.00815	0.01193	0.03013	1.08405	1.17450	1.10826	1.15921	0.02941	0.01861	0.63287
189	0.00004	0.00719	0.00359	0.64909	0.00290	0.00579	1.54062	1.85480	0.00495	0.00293	0.00379	0.00979	1.23310	1.17450	1.23819	1.18087	0.00872	0.00593	0.68003
190	0.00083	0.03256	0.01628	0.74899	0.01351	0.02703	1.33513	1.85636	0.02172	0.01166	0.01687	0.04255	1.55920	1.17832	1.57959	1.21399	0.04170	0.02542	0.60957
191	0.00693	0.09392	0.04696	0.37595	0.02821	0.05641	2.65990	1.78015	0.06686	0.02245	0.04672	0.12275	2.50059	1.26749	2.60377	1.20380	0.12625	0.06986	0.55334
192	0.00159	0.04502	0.02251	0.43182	0.01422	0.02843	2.31577	2.82729	0.03977	0.00887	0.02420	0.07275	0.11847	1.18087	0.13248	1.25093	0.07657	0.02647	0.34572
193	0.01135	0.12021	0.06010	0.72881	0.05074	0.10147	1.37209	1.60503	0.07579	0.04254	0.06105	0.15059	1.26112	1.18214	1.30061	1.32609	0.15070	0.09589	0.63630
194	0.00902	0.10717	0.05359	0.28728	0.02813	0.05627	3.48093	3.17686	0.09846	0.01741	0.05763	0.18711	2.09295	1.21526	2.27766	1.19488	0.18402	0.06241	0.33917
195	0.00053	0.02599	0.01300	0.43428	0.00800	0.01599	2.30268	4.02035	0.02442	0.00525	0.01526	0.04866	0.62674	1.22800	0.65731	1.19233	0.05273	0.01281	0.24301
196	0.00170	0.04658	0.02329	0.57060	0.01700	0.03400	1.75254	2.03999	0.03384	0.01399	0.02383	0.06429	1.38468	1.19488	1.42290	1.24456	0.06269	0.03461	0.55201
197	0.00118	0.03870	0.01935	0.57846	0.01414	0.02829	1.72873	2.05158	0.02837	0.01313	0.01988	0.05327	2.02161	1.19488	2.04327	1.24201	0.05101	0.02936	0.57564
198	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.39107	1.19615	0.39362	1.19870	0.00424	0.00424	1.00000
199	0.00048	0.02481	0.01241	0.56341	0.00874	0.01748	1.77491	2.06167	0.01898	0.00791	0.01286	0.03344	0.36432	1.22290	0.38980	1.20380	0.03352	0.01837	0.54784
200	0.00002	0.00557	0.00278	0.73631	0.00239	0.00478	1.35812	1.63625	0.00356	0.00191	0.00294	0.00712	0.39235	1.21399	0.39490	1.21908	0.00707	0.00438	0.61930
201	0.00009	0.01046	0.00523	0.72348	0.00387	0.00773	1.38220	2.92090	0.00786	0.00321	0.00557	0.01554	0.61782	1.21399	0.62037	1.22800	0.01627	0.00673	0.41357
202	0.00082	0.03233	0.01617	0.51058	0.01097	0.02194	1.95855	2.70565	0.02874	0.00626	0.01727	0.05052	1.56557	1.22800	1.57449	1.27641	0.05209	0.02007	0.38536
203	0.00444	0.07520	0.03760	0.47127	0.02522	0.05044	2.12193	1.71049	0.05040	0.02355	0.03814	0.09610	0.58343	1.32991	0.59362	1.23564	0.09770	0.05788	0.59



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-29 14.1m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾点X	絶対最大長傾点Y	絶対最大長傾点Z	絶対最大長傾点V	楕円長軸	楕円短軸	楕円長短比
205	0.00244	0.05576	0.02788	0.36217	0.01621	0.03241	2.76116	2.20420	0.04379	0.00133	0.02784	0.07996	0.15668	1.31335	0.19872	1.24711	0.08512	0.03653	0.42918
206	0.01547	0.14034	0.07017	0.58936	0.05328	0.10656	1.69674	1.39914	0.08581	0.05508	0.07053	0.16419	0.23949	1.38978	0.36178	1.28278	0.16222	0.12142	0.74849
207	0.00008	0.01037	0.00518	0.90300	0.00432	0.00864	1.10742	2.17988	0.00678	0.00430	0.00531	0.01342	0.63056	1.26622	0.63948	1.25857	0.01180	0.00911	0.77172
208	0.00322	0.06407	0.03204	0.45467	0.02103	0.04207	2.19940	3.65614	0.06414	0.01123	0.03627	0.11930	0.89807	1.33755	0.99361	1.26876	0.12027	0.03414	0.28383
209	0.00467	0.07709	0.03854	0.60253	0.02935	0.05870	1.65968	2.39715	0.05899	0.02453	0.04057	0.11708	1.59360	1.27004	1.65856	1.36558	0.10678	0.05565	0.52111
210	0.00356	0.06733	0.03366	0.49681	0.02315	0.04630	2.01283	2.04308	0.05016	0.01206	0.03520	0.09388	0.46623	1.27895	0.50190	1.36430	0.10497	0.04318	0.41141
211	0.00237	0.05489	0.02744	0.52988	0.01940	0.03880	1.88721	2.26153	0.04339	0.01885	0.02898	0.08015	0.76814	1.35539	0.82546	1.30188	0.07388	0.04078	0.55194
212	0.00042	0.02322	0.01161	0.72407	0.00929	0.01859	1.38108	1.95296	0.01676	0.00863	0.01202	0.03053	1.73627	1.32099	1.76175	1.33500	0.03011	0.01791	0.59495
213	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	1.07386	1.33118	1.07768	1.33500	0.00572	0.00572	1.00000
214	0.02357	0.17322	0.08661	0.34254	0.05011	0.10022	2.91938	2.34168	0.14109	0.03535	0.08904	0.26204	0.86622	1.55411	1.01654	1.34137	0.25915	0.11578	0.44675
215	0.00268	0.05842	0.02921	0.54724	0.02103	0.04207	1.82736	2.15752	0.04596	0.01213	0.03000	0.08352	1.13373	1.39233	1.20889	1.35921	0.08280	0.04122	0.49784
216	0.00005	0.00813	0.00407	0.64782	0.00268	0.00536	1.54363	3.53075	0.00637	0.00191	0.00439	0.01252	1.70442	1.34265	1.71334	1.34902	0.01276	0.00518	0.40580
217	0.00459	0.07648	0.03824	0.63922	0.02999	0.05997	1.56441	2.14731	0.05943	0.02471	0.04007	0.10992	2.13626	1.37959	2.24454	1.37067	0.11212	0.05217	0.46527
218	0.00319	0.06373	0.03187	0.57732	0.02364	0.04729	1.73215	2.08530	0.05008	0.02027	0.03295	0.08987	1.32099	1.39360	1.40252	1.35921	0.08933	0.04547	0.50906
219	0.00044	0.02371	0.01185	0.32900	0.00622	0.01244	3.03952	3.16618	0.02056	0.00131	0.01211	0.03858	1.83054	1.39870	1.83563	1.36176	0.03836	0.01465	0.39892
220	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	0.00510	1.36430	0.00892	1.36685	0.00519	0.00477	0.91906
221	0.00026	0.01818	0.00909	0.75299	0.00731	0.01463	1.32803	2.36939	0.01367	0.00468	0.00951	0.02594	0.78724	1.37832	0.79871	1.39997	0.02527	0.01308	0.51767
222	0.00461	0.07661	0.03831	0.26074	0.01898	0.03797	3.83520	2.57475	0.06416	0.00955	0.03809	0.11931	0.45222	1.38214	0.46623	1.49933	0.12132	0.04838	0.39880
223	0.00589	0.08658	0.04329	0.41269	0.02723	0.05446	2.42314	2.53917	0.06822	0.00618	0.04231	0.13508	1.07641	1.38978	1.18851	1.46239	0.14726	0.05090	0.34567
224	0.00589	0.08658	0.04329	0.21333	0.01941	0.03883	4.68765	2.70467	0.07705	0.00489	0.04402	0.13825	1.61016	1.42035	1.74519	1.39742	0.15535	0.04825	0.31060
225	0.00041	0.02282	0.01141	0.73537	0.00920	0.01841	1.35986	1.58929	0.01383	0.00723	0.01153	0.02706	1.17832	1.42290	1.20125	1.41144	0.02707	0.01923	0.71030
226	0.00045	0.02384	0.01192	0.36413	0.00661	0.01323	2.74625	3.63551	0.02362	0.00553	0.01354	0.04179	0.60763	1.44710	0.61655	1.40761	0.04332	0.01312	0.20750
227	0.00097	0.03515	0.01758	0.29703	0.00901	0.01803	3.36687	4.56747	0.04432	0.00652	0.02264	0.07069	2.33244	1.41271	2.39740	1.43691	0.07876	0.01569	0.19920
228	0.01214	0.12432	0.06216	0.31108	0.03409	0.06818	3.21464	2.56825	0.10471	0.00122	0.06067	0.19591	1.19488	1.47386	1.37959	1.53500	0.21454	0.07204	0.33577
229	0.00007	0.00953	0.00477	0.71846	0.00345	0.00689	1.39186	2.37222	0.00693	0.00296	0.00501	0.01252	2.10314	1.42035	2.11206	1.42672	0.01302	0.00698	0.53608
230	0.00444	0.07521	0.03761	0.25397	0.01838	0.03675	3.93754	2.55639	0.06883	0.02210	0.04193	0.11661	0.23184	1.53245	0.27133	1.42417	0.11475	0.04930	0.42965
231	0.00281	0.05980	0.02990	0.70601	0.02455	0.04910	1.41640	1.45469	0.03773	0.02370	0.03035	0.07047	0.64585	1.47386	0.69935	1.43054	0.06868	0.05208	0.75827
232	0.00421	0.07319	0.03660	0.64125	0.02872	0.05744	1.55945	1.44196	0.04668	0.02619	0.03704	0.08614	1.37832	1.49042	1.46239	1.47895	0.08862	0.06045	0.68210
233	0.00187	0.04885	0.02443	0.58621	0.01813	0.03626	1.70587	2.04444	0.03492	0.00906	0.02445	0.06771	0.52993	1.53245	0.53502	1.46621	0.07090	0.03366	0.47478
234	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	1.07386	1.33118	1.07768	1.33500	0.00572	0.00572	1.00000
235	0.00228	0.05384	0.02692	0.61536	0.02055	0.04109	1.62508	2.13276	0.04082	0.00866	0.02781	0.07650	2.04454	1.51589	2.11843	1.50188	0.07979	0.03633	0.45531
236	0.00210	0.05169	0.02584	0.67380	0.02065	0.04130	1.48412	1.73370	0.03700	0.01619	0.02616	0.06624	2.56937	1.47895	2.58721	1.54137	0.06479	0.04124	0.63647
237	0.00097	0.03512	0.01756	0.46058	0.01136	0.02271	2.17115	3.87015	0.03592	0.00885	0.01993	0.06583	1.09170	1.53373	1.12737	1.48022	0.06192	0.01992	0.32167
238	0.00419	0.07302	0.03651	0.58864	0.02743	0.05486	1.69884	2.47693	0.06191	0.02013	0.03882	0.11254	1.55283	1.49169	1.66111	1.51717	0.11483	0.04644	0.40442
239	0.00407	0.07197	0.03599	0.67604	0.02901	0.05801	1.47920	1.78905	0.04946	0.02264	0.03676	0.09437	1.70315	1.49042	1.78468	1.53500	0.09419	0.05499	0.58379
240	0.00166	0.04602	0.02301	0.67787	0.01836	0.03672	1.47521	1.89906	0.03422	0.01592	0.02392	0.06145	2.28276	1.51207	2.33881	1.49042	0.06051	0.03500	0.57839
241	0.00195	0.04983	0.02492	0.28011	0.01261	0.02522	3.57009	2.47402	0.04148	0.00764	0.02556	0.07495	1.88659	1.48914	1.92098	1.55411	0.08135	0.03053	0.37528
242	0.00108	0.03707	0.01853	0.42869	0.01159	0.02319	2.33269	3.41004	0.03316	0.00257	0.02077	0.06540	0.76177	1.51844	0.82291	1.49933	0.08937	0.01981	0.28555
243	0.00095	0.03471	0.01735	0.57333	0.01255	0.02510	1.74420	3.06808	0.02948	0.01048	0.01875	0.05807	0.41273	1.50443	0.46114	1.53373	0.05444	0.02212	0.40637
244	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	1.12354	1.52226	1.12864	1.52736	0.00757	0.00683	0.90212
245	0.00465	0.07698	0.03849	0.67716	0.03110	0.06220	1.47675	1.70558	0.05371	0.02860	0.03918	0.09872	0.76814	1.55538	0.85094	1.60634	0.09297	0.06374	0.68555
246	0.00612	0.08830	0.04415	0.49534	0.03049	0.06098	2.01882	2.11505	0.06688	0.01883	0.04559	0.12601	0.64203	1.62035	0.74903	1.55666	0.12425	0.06276	0.50509
247	0.00282	0.05989	0.02994	0.56126	0.02184	0.04369	1.78170	2.40207	0.04719	0.02059	0.03165	0.09038	1.67003	1.61398	1.69933	1.52990	0.08455	0.04242	0.50175
248	0.02592	0.18166	0.09083	0.37548	0.05507	0.11014	2.66324	2.36936	0.16138	0.05008	0.09803	0.27668	1.39488	1.70697	1.64455	1.59105	0.27405	0.12043	0.43944
249	0.00003	0.00643	0.00321	0.51927	0.00232	0.00463	1.92577	2.31850	0.00489	0.00214	0.00354	0.00979	1.46876	1.53373	1.47513	1.53882	0.00958	0.00431	0.45048
250	0.00057	0.02704	0.01352	0.75511	0.01117	0.02234	1.32430	2.10779	0.01956	0.00855	0.01407	0.03733	1.15284	1.55538	1.18469	1.53882	0.03581	0.02042	0.57036
251	0.00814	0.10179	0.05090	0.21833	0.02319	0.04638	4.58022	3.73714	0.09931	0.01761	0.05601	0.19190	0.87387	1.68149	1.02673	1.56812	0.21188	0.04890	0.23080
252	0.00709	0.09499	0.04749	0.39367	0.02921	0.05842	2.54017	2.06709	0.07401	0.00762	0.04690	0.13388	0.25095	1.62290	0.37706	1.58213	0.13841	0.06519	0.47095
253	0.00148	0.04346	0.02173	0.57376	0.01589	0.03178	1.74288	2.99710	0.03985	0.01209	0.02411	0.07264	1.14647	1.59360	1.21017	1.56175	0.07003	0.02697	0.38505
254	0.00683	0.09323	0.04662	0.53263	0.03345	0.06690	1.87746	1.74975	0.06580	0.02521	0.04768	0.12126	2.00123	1.68786	2.00888	1.56812	0.12266	0.07086	0.57



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-29 14.1m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸X	絶対最大長軸Y	絶対最大長軸Z	楕円長軸	楕円短軸	楕円長短比	
256	0.00023	0.01695	0.00847	0.43185	0.00500	0.01000	2.31564	2.90885	0.01420	0.00465	0.00933	0.02594	0.08662	1.58086	0.09809	1.60251	0.02826	0.01016	0.35960
257	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	0.11720	1.58468	0.11974	1.58850	0.00519	0.00477	0.91906
258	0.00438	0.07466	0.03733	0.31260	0.02029	0.04058	3.19897	2.40359	0.06183	0.01994	0.04002	0.11253	0.39235	1.63691	0.49298	1.58978	0.11890	0.04688	0.39432
259	0.00062	0.02802	0.01401	0.57628	0.01007	0.02013	1.73528	2.22760	0.02243	0.00896	0.01463	0.03959	2.14645	1.60379	2.18085	1.58723	0.03838	0.02046	0.53304
260	0.00120	0.03907	0.01954	0.55589	0.01400	0.02801	1.79892	2.78824	0.03263	0.01129	0.02135	0.06273	2.39740	1.59360	2.44708	1.62927	0.05973	0.02556	0.42801
261	0.00122	0.03939	0.01970	0.52319	0.01367	0.02733	1.91133	2.18544	0.03488	0.00928	0.02115	0.05586	0.10318	1.59487	0.14395	1.63054	0.05952	0.02607	0.43805
262	0.03001	0.19546	0.09773	0.64538	0.07793	0.15586	1.54947	1.67536	0.13237	0.06566	0.09875	0.25112	0.96304	1.67895	1.21144	1.70570	0.25025	0.15267	0.61007
263	0.00011	0.01177	0.00588	0.58773	0.00393	0.00787	1.70147	2.87738	0.00913	0.00396	0.00635	0.01741	0.77705	1.61016	0.79107	1.60251	0.01753	0.00790	0.45046
264	0.00205	0.05110	0.02555	0.51514	0.01776	0.03553	1.94121	1.89115	0.03692	0.01448	0.02632	0.06807	2.31205	1.65092	2.37193	1.62162	0.06880	0.03796	0.55178
265	0.00004	0.00704	0.00352	0.62313	0.00278	0.00556	1.60481	1.93208	0.00495	0.00290	0.00374	0.00979	0.98979	1.62035	0.99616	1.61525	0.00901	0.00551	0.61133
266	0.00085	0.03281	0.01640	0.53216	0.01138	0.02276	1.87913	1.85888	0.02301	0.00989	0.01654	0.04253	2.47766	1.61653	2.49294	1.65474	0.04288	0.02510	0.58535
267	0.00004	0.00733	0.00366	0.67505	0.00301	0.00602	1.48137	1.85022	0.00498	0.00255	0.00383	0.00997	2.18722	1.62035	2.19486	1.62417	0.00967	0.00556	0.57488
268	0.00383	0.06984	0.03492	0.33331	0.01958	0.03916	3.00017	2.08867	0.05217	0.02026	0.03665	0.09802	2.12480	1.66876	2.21651	1.63818	0.09578	0.05093	0.53176
269	0.00144	0.04286	0.02143	0.61806	0.01627	0.03254	1.61796	2.42969	0.03299	0.01104	0.02223	0.06451	0.77451	1.67130	0.82546	1.63436	0.06264	0.02932	0.46805
270	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	2.45855	1.63181	2.46110	1.63436	0.00424	0.00424	1.00000
271	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.91845	1.63436	0.92100	1.63691	0.00424	0.00424	1.00000
272	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	2.11588	1.63818	2.11970	1.64328	0.00712	0.00580	0.81492
273	0.00773	0.09919	0.04960	0.23521	0.02347	0.04693	4.25156	2.82633	0.09038	0.01433	0.05071	0.16270	0.00764	1.79359	0.08280	1.65092	0.16280	0.06044	0.37123
274	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	2.45727	1.64837	2.45982	1.65092	0.00424	0.00424	1.00000
275	0.00012	0.01253	0.00627	0.50932	0.00389	0.00778	1.96342	3.63778	0.01043	0.00096	0.00680	0.02079	2.45345	1.66366	2.47129	1.65602	0.02246	0.00699	0.31116
276	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	2.44454	1.65856	2.44708	1.66111	0.00424	0.00424	1.00000
277	0.01148	0.12090	0.06045	0.42706	0.03892	0.07785	2.34158	2.05242	0.08794	0.02629	0.06160	0.17066	1.81398	1.70952	1.98212	1.72990	0.15936	0.09172	0.57555
278	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	2.47001	1.66748	2.47256	1.67130	0.00519	0.00477	0.91906
279	0.00264	0.05801	0.02901	0.58811	0.02166	0.04333	1.70035	1.42384	0.03624	0.01657	0.02899	0.06742	0.57196	1.66876	0.59362	1.73117	0.06990	0.04815	0.68878
280	0.00029	0.01907	0.00953	0.34947	0.00505	0.01011	2.86150	4.48927	0.02031	0.00475	0.01095	0.03623	0.48279	1.67258	0.51082	1.69296	0.03455	0.01053	0.30464
281	0.00141	0.04235	0.02117	0.41500	0.01306	0.02613	2.40962	3.58550	0.04139	0.01074	0.02363	0.07679	0.64967	1.67130	0.69171	1.73372	0.07407	0.02421	0.32684
282	0.00126	0.04009	0.02005	0.33697	0.01107	0.02213	2.96760	3.99487	0.04713	0.00653	0.02382	0.07620	0.39362	1.68277	0.45859	1.71971	0.07900	0.02035	0.25756
283	0.00678	0.09294	0.04647	0.35896	0.02726	0.05452	2.78583	2.43605	0.08102	0.02812	0.05067	0.14202	0.92227	1.82034	0.94520	1.68149	0.13535	0.06382	0.47156
284	0.00186	0.04864	0.02432	0.64491	0.01896	0.03793	1.55061	1.94213	0.03336	0.01464	0.02525	0.06582	2.52988	1.72481	2.58848	1.69805	0.06578	0.03596	0.54674
285	0.01842	0.15316	0.07658	0.31492	0.04239	0.08479	3.17538	1.91241	0.11269	0.02116	0.07332	0.20893	1.17705	1.87767	1.28915	1.70315	0.24258	0.09669	0.39860
286	0.00389	0.07042	0.03521	0.20713	0.01545	0.03090	4.82799	5.51275	0.08686	0.00322	0.04068	0.15943	0.74521	1.70442	0.85731	1.81525	0.16573	0.02992	0.18054
287	0.00109	0.03718	0.01859	0.63716	0.01428	0.02856	1.56947	2.84366	0.03082	0.01039	0.02042	0.06033	0.81782	1.74901	0.85985	1.70825	0.06103	0.02265	0.37106
288	0.01028	0.11439	0.05719	0.30243	0.03088	0.06176	3.30656	2.63692	0.10557	0.01795	0.06136	0.18236	0.26624	1.75920	0.43566	1.82289	0.20162	0.06490	0.32189
289	0.00003	0.00575	0.00287	0.78540	0.00255	0.00510	1.27324	1.57080	0.00360	0.00269	0.00299	0.00721	2.06747	1.72098	2.07130	1.72481	0.00572	0.00572	1.00000
290	0.00205	0.05114	0.02557	0.76717	0.02181	0.04362	1.30349	1.56440	0.03238	0.02092	0.02580	0.06229	2.39868	1.77831	2.43180	1.72735	0.05823	0.04492	0.77147
291	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	2.05983	1.72863	2.06238	1.73117	0.00424	0.00424	1.00000
292	0.00003	0.00643	0.00321	0.77570	0.00283	0.00566	1.28916	1.53398	0.00398	0.00255	0.00331	0.00796	0.43948	1.73245	0.44458	1.73627	0.00712	0.00580	0.81492
293	0.00133	0.04116	0.02058	0.53056	0.01442	0.02884	1.88479	2.46640	0.03506	0.01084	0.02184	0.06219	0.12484	1.73372	0.14522	1.79105	0.05898	0.02873	0.48709
294	0.01130	0.11993	0.05996	0.57235	0.04479	0.08957	1.74717	2.06140	0.08665	0.03105	0.06192	0.16999	2.22798	1.75410	2.36301	1.85474	0.17654	0.08147	0.46147
295	0.02037	0.16103	0.08051	0.33193	0.04581	0.09162	3.01273	3.25152	0.14584	0.03807	0.08707	0.28677	1.27768	1.92990	1.51080	1.76557	0.28278	0.09170	0.32426
296	0.01041	0.11511	0.05755	0.36283	0.03408	0.06817	2.75612	2.12286	0.08773	0.02992	0.05757	0.16489	1.95028	1.82544	2.10569	1.77449	0.16045	0.08258	0.51468
297	0.00020	0.01613	0.00807	0.79453	0.00663	0.01325	1.25860	2.17974	0.01156	0.00626	0.00839	0.02195	2.44708	1.76302	2.46619	1.77066	0.02078	0.01253	0.60287
298	0.00061	0.02795	0.01397	0.63016	0.01051	0.02102	1.58690	2.36496	0.02221	0.00716	0.01471	0.04073	2.51205	1.78213	2.54772	1.79869	0.03986	0.01959	0.49151
299	0.00012	0.01220	0.00610	0.73685	0.00468	0.00936	1.35713	3.09388	0.00970	0.00422	0.00669	0.01917	0.54649	1.77831	0.55540	1.79359	0.01832	0.00812	0.44338
300	0.00005	0.00826	0.00413	0.35826	0.00192	0.00385	2.79129	5.13903	0.00864	0.00114	0.00485	0.01457	1.34137	1.79359	1.34774	1.78213	0.01739	0.00392	0.22548
301	0.00318	0.06364	0.03182	0.68166	0.02568	0.05137	1.46701	2.02025	0.04775	0.02102	0.03290	0.08843	1.59105	1.78468	1.62162	1.86620	0.08598	0.04710	0.54775
302	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	2.51460	1.80124	2.51715	1.80378	0.00424	0.00424	1.00000
303	0.00113	0.03792	0.01896	0.56541	0.01367	0.02733	1.76864	1.85989	0.02674	0.00927	0.01928	0.04957	0.22929	1.85856	0.25477	1.81780	0.05167	0.02783	0.53857
304	0.01003	0.11301	0.05650	0.34860	0.03277	0.06554	2.86861	1.98295	0.09286	0.03443	0.05887	0.15632	2.17957	1.82417	2.26747	1.95155	0.15284	0.08356	0.54671
305	0.00003	0.00659	0.00329	0.65973	0.00268	0.00535	1.51576	1.83110	0.00448	0.00256	0.00348	0.00891	2.17193	1.83181	2.17830	1.83563	0.00836	0.00519	0.62134
306	0.00660</																		



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-29 14.1m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸点X	絶対最大長軸点Y	絶対最大長軸点X	絶対最大長軸点Y	楕円長軸	楕円短軸	楕円長短比
307	0.00046	0.02422	0.01211	0.32287	0.00633	0.01265	3.09718	4.00533	0.02242	0.00628	0.01436	0.04457	0.97578	1.83563	0.98597	1.87767	0.04532	0.01295	0.28566
308	0.00322	0.06407	0.03204	0.33598	0.01799	0.03598	2.97633	3.58517	0.06003	0.01043	0.03634	0.11752	0.01274	1.83690	0.03185	1.95155	0.11334	0.03622	0.31957
309	0.00005	0.00826	0.00413	0.54676	0.00249	0.00499	1.82897	4.56959	0.00764	0.00142	0.00467	0.01441	0.68151	1.84200	0.69043	1.85092	0.01478	0.00461	0.31223
310	0.00304	0.06222	0.03111	0.28444	0.01602	0.03203	3.51563	3.39771	0.06378	0.00986	0.03468	0.11071	2.37702	1.87003	2.46747	1.93117	0.11752	0.03295	0.28033
311	0.00002	0.00498	0.00249	0.76937	0.00218	0.00437	1.29977	1.51262	0.00306	0.00214	0.00259	0.00612	2.01015	1.85092	2.01397	1.85347	0.00519	0.00477	0.91906
312	0.00003	0.00627	0.00313	0.73692	0.00269	0.00538	1.35701	1.61472	0.00400	0.00245	0.00325	0.00796	1.96174	1.87767	1.96684	1.87385	0.00687	0.00572	0.83266
313	0.00208	0.05149	0.02574	0.45672	0.01680	0.03361	2.18952	3.16646	0.05191	0.01400	0.02917	0.08849	1.04839	1.94900	1.13373	1.93117	0.08726	0.03038	0.34817
314	0.00060	0.02761	0.01381	0.46935	0.00887	0.01774	2.13059	2.39270	0.02180	0.00735	0.01479	0.04005	0.23821	1.95155	0.25987	1.91971	0.04044	0.01885	0.46619
315	0.00001	0.00431	0.00216	0.78540	0.00191	0.00382	1.27324	1.57080	0.00270	0.00191	0.00231	0.00540	0.23312	1.92353	0.23566	1.92608	0.00424	0.00424	1.00000
316	0.00150	0.04367	0.02183	0.41916	0.01355	0.02709	2.38570	4.68019	0.05052	0.01015	0.02696	0.09053	1.73117	1.95155	1.82034	1.94773	0.08340	0.02287	0.27416
317	0.00081	0.03217	0.01609	0.49691	0.01074	0.02148	2.01242	3.26554	0.02799	0.00662	0.01775	0.05507	2.10696	1.93881	2.15919	1.95155	0.05685	0.01821	0.32034
318	0.00010	0.01141	0.00570	0.50144	0.00347	0.00694	1.99425	3.15583	0.00911	0.00144	0.00621	0.01741	0.22547	1.93754	0.23312	1.95155	0.01913	0.00680	0.35559
319	0.00006	0.00886	0.00443	0.82915	0.00346	0.00693	1.20606	2.71111	0.00665	0.00333	0.00469	0.01252	0.00382	1.94264	0.01019	1.95155	0.01163	0.00675	0.58060
320	0.00006	0.00838	0.00419	0.83640	0.00325	0.00651	1.19560	2.72158	0.00627	0.00288	0.00442	0.01174	2.07512	1.94646	2.08403	1.95155	0.01112	0.00632	0.56847
321	0.00004	0.00733	0.00366	0.56723	0.00276	0.00552	1.76295	2.28838	0.00622	0.00232	0.00394	0.01109	1.01527	1.95155	1.02418	1.94773	0.01052	0.00511	0.48548
322	0.00006	0.00898	0.00449	0.15008	0.00121	0.00243	6.66323	16.71791	0.01595	0.00152	0.00743	0.02562	0.79616	1.95155	0.82037	1.94900	0.02700	0.00298	0.11054
323	0.00004	0.00674	0.00337	0.26998	0.00175	0.00350	3.70397	6.99718	0.00986	0.00130	0.00496	0.01783	0.77323	1.95155	0.78979	1.95155	0.01849	0.00246	0.13289
324	0.00003	0.00610	0.00305	0.46734	0.00208	0.00417	2.13975	3.58952	0.00578	0.00127	0.00363	0.01155	1.89295	1.95028	1.90315	1.95155	0.01310	0.00284	0.21683



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-33 12.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸点X	絶対最大長軸点Y	絶対最大長軸点X	絶対最大長軸点Y	楕円長軸	楕円短軸	楕円長短比
1	0.01932	0.15682	0.07841	0.39072	0.04838	0.09677	2.55940	1.84944	0.12312	0.04393	0.07947	0.21054	0.01019	0.00255	0.17579	0.12993	0.20678	0.11893	0.57516
2	0.00838	0.10328	0.05164	0.17293	0.02086	0.04173	5.78261	5.77494	0.12726	0.00406	0.06353	0.24114	0.41528	0.04713	0.65094	0.00255	0.25002	0.04267	0.17065
3	0.00133	0.04121	0.02061	0.57618	0.01502	0.03005	1.73557	2.47318	0.03643	0.01279	0.02216	0.06226	0.66241	0.00255	0.72228	0.01401	0.06082	0.02792	0.45906
4	0.00614	0.08841	0.04420	0.57909	0.03302	0.06603	1.72685	2.25064	0.06646	0.02455	0.04634	0.13018	1.00890	0.00637	1.11845	0.07388	0.13374	0.05844	0.43700
5	0.00298	0.06162	0.03081	0.38332	0.01846	0.03693	2.60879	3.52141	0.05832	0.01281	0.03374	0.11193	1.16176	0.08662	1.23310	0.00255	0.11348	0.03346	0.29488
6	0.00057	0.02704	0.01352	0.66147	0.01039	0.02078	1.51179	2.40031	0.02095	0.00726	0.01420	0.03959	2.03563	0.03694	2.05219	0.00255	0.04082	0.01792	0.43895
7	0.00071	0.03001	0.01501	0.57728	0.01078	0.02157	1.73225	2.36655	0.02235	0.00547	0.01542	0.04367	2.12352	0.00255	2.16429	0.01401	0.04576	0.01969	0.43029
8	0.00017	0.01452	0.00726	0.76156	0.00571	0.01143	1.31309	2.27478	0.01014	0.00460	0.00741	0.01975	2.17193	0.00255	2.18594	0.01401	0.01811	0.01164	0.64266
9	0.00891	0.10648	0.05324	0.27772	0.02744	0.05487	3.60069	2.72106	0.08796	0.01466	0.05653	0.17176	2.42798	0.07771	2.58084	0.00255	0.16244	0.06980	0.42973
10	0.00024	0.01731	0.00865	0.73542	0.00681	0.01362	1.35976	2.33692	0.01243	0.00577	0.00891	0.02427	2.58848	0.00255	2.60504	0.01783	0.02226	0.01346	0.60470
11	0.00172	0.04673	0.02337	0.54528	0.01664	0.03328	1.83393	2.28554	0.03617	0.01225	0.02457	0.06813	2.04454	0.06879	2.07130	0.00764	0.06978	0.03130	0.44856
12	0.00980	0.11173	0.05586	0.26257	0.02801	0.05602	3.80845	4.12379	0.12070	0.00201	0.05975	0.22202	1.42545	0.01274	1.46112	0.23057	0.23774	0.05251	0.22086
13	0.01133	0.12013	0.06007	0.30851	0.03274	0.06549	3.24138	4.42723	0.12996	0.02230	0.07438	0.24809	1.25282	0.05095	2.39868	0.07261	0.27725	0.05205	0.18775
14	0.00012	0.01211	0.00606	0.50724	0.00371	0.00742	1.97147	4.10209	0.01101	0.00224	0.00696	0.02109	2.59995	0.02420	2.60504	0.04331	0.02365	0.00620	0.26218
15	0.01286	0.12797	0.06398	0.11907	0.02147	0.04293	8.39815	3.86542	0.13928	0.01436	0.07483	0.24461	1.22673	0.25732	1.35921	0.05350	0.26693	0.06135	0.22984
16	0.00654	0.09124	0.04562	0.42592	0.02916	0.05832	2.34785	2.20256	0.07533	0.01921	0.04574	0.13262	1.81652	0.04841	1.92735	0.11847	0.12916	0.06445	0.49897
17	0.00262	0.05780	0.02890	0.53374	0.02049	0.04099	1.87358	1.61049	0.03620	0.01695	0.02877	0.07120	2.55281	0.07898	2.60504	0.12484	0.07322	0.04563	0.62313
18	0.00105	0.03662	0.01831	0.58394	0.01340	0.02679	1.71250	2.74323	0.02992	0.00907	0.01979	0.05807	1.05858	0.10573	1.10698	0.07643	0.06069	0.02209	0.36403
19	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.47131	0.07771	1.47895	0.08535	0.01127	0.00898	0.79709
20	0.00285	0.06020	0.03010	0.14608	0.01089	0.02179	6.84577	2.54605	0.04602	0.00877	0.02786	0.09096	0.83056	0.14522	0.89170	0.08025	0.09837	0.03684	0.37449
21	0.00425	0.07357	0.03679	0.55818	0.02688	0.05376	1.79153	1.78105	0.05498	0.02408	0.03802	0.09604	0.29936	0.13885	0.38853	0.17070	0.10213	0.05300	0.51896
22	0.00101	0.03588	0.01794	0.42262	0.01106	0.02211	2.36622	2.05246	0.02544	0.00549	0.01730	0.04873	0.20637	0.12229	0.24968	0.10318	0.04784	0.02691	0.56241
23	0.00436	0.07452	0.03726	0.37222	0.02213	0.04425	2.68657	1.94827	0.05185	0.01717	0.03851	0.10124	0.23566	0.20127	0.27515	0.10955	0.10238	0.05425	0.52987
24	0.00883	0.10602	0.05301	0.35884	0.03114	0.06228	2.78679	2.07993	0.08260	0.02083	0.05498	0.14993	2.12352	0.13758	2.26110	0.19363	0.15294	0.07349	0.48050
25	0.00220	0.05297	0.02648	0.47647	0.01767	0.03533	2.09878	2.24842	0.04034	0.01084	0.02715	0.07675	0.57833	0.19235	0.59362	0.11847	0.07622	0.03681	0.48294
26	0.00718	0.09563	0.04781	0.39511	0.02945	0.05890	2.53094	2.06601	0.06742	0.01431	0.04581	0.13271	0.50700	0.12102	0.53375	0.24968	0.13556	0.06746	0.49764
27	0.00301	0.06191	0.03095	0.34890	0.01767	0.03533	2.86612	2.13883	0.04564	0.01048	0.02995	0.08749	2.45855	0.18598	2.51460	0.12102	0.09093	0.04215	0.46355
28	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	0.81272	0.12229	0.82037	0.12993	0.01127	0.00898	0.79709
29	0.00009	0.01076	0.00538	0.87656	0.00441	0.00882	1.14083	2.02780	0.00671	0.00452	0.00550	0.01342	0.79744	0.12356	0.80635	0.13121	0.01234	0.00938	0.76013
30	0.00477	0.07792	0.03896	0.37762	0.02333	0.04666	2.64815	2.16501	0.06226	0.02009	0.03928	0.11172	0.98597	0.19490	1.09042	0.15923	0.11019	0.05511	0.50014
31	0.00505	0.08021	0.04011	0.35433	0.02326	0.04651	2.82226	2.70583	0.06848	0.01825	0.04241	0.12853	0.80890	0.13376	0.86877	0.24585	0.11882	0.05415	0.45572
32	0.00043	0.02335	0.01168	0.29374	0.00572	0.01144	3.40435	2.78301	0.01784	0.00269	0.01134	0.03520	2.09550	0.15796	2.10696	0.18981	0.03659	0.01491	0.40733
33	0.00078	0.03159	0.01580	0.43176	0.00976	0.01953	2.31610	4.56617	0.03307	0.00666	0.01911	0.06351	2.59358	0.15796	2.60504	0.21910	0.06808	0.01466	0.21529
34	0.00717	0.09552	0.04776	0.22373	0.02197	0.04395	4.46959	2.41404	0.08369	0.01825	0.05147	0.14436	1.85729	0.17452	1.90060	0.31082	0.15739	0.05797	0.36832
35	0.00669	0.09226	0.04613	0.53233	0.03305	0.06610	1.87852	2.04831	0.07008	0.02717	0.04812	0.12965	0.55668	0.23694	0.67005	0.17707	0.12629	0.06740	0.53372
36	0.00047	0.02456	0.01228	0.66904	0.00943	0.01887	1.49469	2.09355	0.01687	0.00798	0.01244	0.03337	0.21401	0.18981	0.22929	0.21783	0.03255	0.01854	0.56952
37	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	0.88406	0.18981	0.89170	0.19745	0.01127	0.00898	0.79709
38	0.00020	0.01594	0.00797	0.53834	0.00523	0.01047	1.85758	3.11214	0.01279	0.00238	0.00818	0.02517	2.08531	0.20764	2.10314	0.19235	0.02591	0.00981	0.37854
39	0.00129	0.04050	0.02025	0.22729	0.00904	0.01808	4.39967	3.22025	0.03473	0.00592	0.02165	0.06805	1.38978	0.19617	1.40507	0.26114	0.07153	0.02294	0.32065
40	0.00280	0.05975	0.02988	0.63564	0.02321	0.04642	1.57321	1.62641	0.03798	0.01531	0.02989	0.07426	1.72863	0.19617	1.74391	0.26751	0.07407	0.04820	0.65076
41	0.00541	0.08302	0.04151	0.55143	0.03021	0.06043	1.81348	1.59373	0.05213	0.02329	0.04106	0.10273	2.10569	0.27770	2.16556	0.19617	0.09854	0.06995	0.70985
42	0.00822	0.10230	0.05115	0.39074	0.03135	0.06271	2.55923	2.19463	0.08072	0.00925	0.04892	0.14862	0.00255	0.20254	0.10573	0.30700	0.15257	0.06859	0.44956
43	0.00011	0.01185	0.00593	0.91046	0.00504	0.01008	1.09835	2.08008	0.00762	0.00510	0.00606	0.01523	1.36048	0.21273	1.37067	0.22165	0.01343	0.01046	0.77901
44	0.00012	0.01261	0.00631	0.85502	0.00521	0.01042	1.16956	2.04962	0.00808	0.00495	0.00647	0.01614	2.42925	0.22929	2.44071	0.22038	0.01502	0.01059	0.70549
45	0.00186	0.04870	0.02435	0.37129	0.01423	0.02846	2.69331	1.71888	0.03292	0.00143	0.02278	0.06124	1.91588	0.27515	1.94900	0.22547	0.06931	0.03422	0.49377
46	0.00015	0.01364	0.00682	0.91091	0.00590	0.01180	1.09780	2.12270	0.00903	0.00626	0.00700	0.01802	1.36812	0.22675	1.37959	0.23821	0.01557	0.01194	0.76656
47	0.00035	0.02122	0.01061	0.77570	0.00873	0.01745	1.28916	1.95283	0.01403	0.00774	0.01084	0.02769	1.34265	0.23694	1.36558	0.24968	0.02688	0.01677	0.62445
48	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.43946	0.23566	1.44710	0.24331	0.01127	0.00898	0.79709
49	0.00034	0.02078	0.01039	0.56429	0.00720	0.01441	1.77212	3.17787	0.01729	0.00308	0.01107	0.03419	1.44965	0.23694	1.47386	0.25859	0.03407	0.01267	0.37200
50	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.42672	0.24458	1.43437	0.25222	0.01127	0.00898	0.79709
51	0.00683	0.09328	0.04664	0.36592	0.027														



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-33 12.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸点X	絶対最大長軸点Y	絶対最大長軸点Z	絶対最大長軸点V	楕円長軸	楕円短軸	楕円長短比
52	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.43691	0.25095	1.44456	0.25859	0.01127	0.00898	0.79709
53	0.01593	0.14240	0.07120	0.46915	0.04816	0.09632	2.13150	2.80272	0.13003	0.03624	0.07757	0.23543	0.69043	0.38980	0.88406	0.25859	0.24139	0.08401	0.34802
54	0.00189	0.04906	0.02453	0.17253	0.00958	0.01915	5.79613	2.66324	0.03953	0.00685	0.02446	0.07525	1.34647	0.27006	1.41908	0.28407	0.08286	0.02905	0.35062
55	0.00013	0.01294	0.00647	0.83372	0.00529	0.01058	1.19945	2.17845	0.00856	0.00496	0.00667	0.01710	1.41653	0.25732	1.42545	0.27006	0.01621	0.01033	0.63722
56	0.00336	0.06540	0.03270	0.54603	0.02357	0.04714	1.83138	2.16311	0.04995	0.01819	0.03414	0.09382	1.27386	0.34139	1.32736	0.26624	0.09892	0.04324	0.43711
57	0.00046	0.02431	0.01215	0.49726	0.00795	0.01590	2.01101	3.27561	0.02103	0.00562	0.01305	0.04080	1.42417	0.29936	1.44328	0.26496	0.04064	0.01454	0.35772
58	0.00014	0.01341	0.00670	0.86169	0.00560	0.01120	1.16051	1.99427	0.00855	0.00558	0.00685	0.01704	1.45602	0.27898	1.46621	0.26751	0.01544	0.01164	0.75435
59	0.00010	0.01132	0.00566	0.91889	0.00482	0.00965	1.08827	2.05165	0.00721	0.00515	0.00577	0.01441	2.44708	0.28280	2.45600	0.27388	0.01245	0.01029	0.82603
60	0.00567	0.08498	0.04249	0.68910	0.03466	0.06932	1.45116	1.44669	0.05295	0.03470	0.04275	0.10044	1.70952	0.29171	1.80378	0.32229	0.09873	0.07314	0.74086
61	0.00681	0.09310	0.04655	0.20675	0.02055	0.04109	4.83665	3.09693	0.08664	0.01481	0.04825	0.15904	2.18849	0.37579	2.31460	0.28152	0.15903	0.05450	0.34271
62	0.00039	0.02227	0.01113	0.66477	0.00846	0.01692	1.50429	2.19443	0.01699	0.00705	0.01163	0.03075	2.37575	0.30318	2.40377	0.29426	0.03160	0.01569	0.49647
63	0.00444	0.07516	0.03758	0.47827	0.02537	0.05074	2.09089	2.07490	0.05475	0.01848	0.03806	0.10569	2.32097	0.34904	2.41524	0.30445	0.10683	0.05288	0.49494
64	0.01791	0.15100	0.07550	0.68667	0.06195	0.12391	1.45631	1.73166	0.10732	0.05364	0.07705	0.19677	0.55031	0.30573	0.62419	0.48661	0.18844	0.12099	0.64208
65	0.00025	0.01790	0.00895	0.81238	0.00744	0.01488	1.23095	1.72514	0.01094	0.00642	0.00907	0.02169	0.37069	0.32101	0.38216	0.33757	0.02072	0.01545	0.74579
66	0.00031	0.01997	0.00998	0.55068	0.00680	0.01360	1.81594	2.39255	0.01505	0.00395	0.01036	0.02834	0.38725	0.33120	0.41273	0.34012	0.02990	0.01334	0.44614
67	0.00560	0.08445	0.04223	0.26194	0.02099	0.04199	3.81762	2.64222	0.07964	0.02573	0.04439	0.13335	0.00255	0.32738	0.09936	0.41655	0.12401	0.05751	0.46375
68	0.00623	0.08906	0.04453	0.58004	0.03330	0.06661	1.72401	1.53998	0.05625	0.02963	0.04498	0.10853	1.32354	0.43693	1.37195	0.34139	0.10878	0.07292	0.67032
69	0.00037	0.02180	0.01090	0.51758	0.00723	0.01446	1.93206	2.75144	0.01706	0.00376	0.01141	0.03334	0.34139	0.34394	0.37069	0.35668	0.03554	0.01337	0.77627
70	0.00014	0.01341	0.00670	0.88387	0.00569	0.01139	1.13138	1.98022	0.00853	0.00559	0.00685	0.01704	1.40889	0.35541	1.41908	0.34394	0.01527	0.01177	0.71112
71	0.00345	0.06631	0.03315	0.33115	0.01846	0.03692	3.01979	2.82931	0.05737	0.01346	0.03466	0.10791	2.45218	0.35923	2.55536	0.38598	0.10491	0.04191	0.39949
72	0.00020	0.01594	0.00797	0.68618	0.00598	0.01197	1.45734	2.42600	0.01152	0.00396	0.00815	0.02250	0.32356	0.35286	0.33630	0.36942	0.02193	0.01159	0.52838
73	0.00010	0.01150	0.00575	0.87295	0.00475	0.00950	1.14554	2.01062	0.00721	0.00515	0.00587	0.01441	2.17703	0.35923	2.18594	0.36815	0.01302	0.01016	0.78059
74	0.00033	0.02048	0.01024	0.58239	0.00720	0.01441	1.71706	2.63795	0.01650	0.00261	0.01050	0.03066	2.42543	0.37961	2.44836	0.36178	0.03152	0.01331	0.42216
75	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.43401	0.25095	1.44456	0.25859	0.01127	0.00898	0.79709
76	0.00012	0.01211	0.00606	0.88293	0.00508	0.01015	1.13259	1.98804	0.00762	0.00503	0.00618	0.01523	2.43817	0.39235	2.44836	0.38343	0.01379	0.01064	0.77185
77	0.00010	0.01141	0.00570	0.85549	0.00465	0.00931	1.16892	2.02861	0.00717	0.00446	0.00585	0.01433	2.45855	0.38343	2.46874	0.39107	0.01363	0.00955	0.70090
78	0.00617	0.08864	0.04432	0.66441	0.03552	0.07104	1.50510	1.35601	0.05180	0.03065	0.04412	0.10148	0.27898	0.42292	0.37706	0.44330	0.10177	0.07721	0.75869
79	0.00220	0.05291	0.02646	0.58210	0.01957	0.03914	1.71791	1.65204	0.03325	0.01664	0.02629	0.06593	1.69168	0.44203	1.72353	0.38598	0.06402	0.04373	0.68313
80	0.00170	0.04651	0.02326	0.60364	0.01746	0.03492	1.65662	2.31103	0.03626	0.01063	0.02412	0.06834	2.48148	0.47005	2.51587	0.41273	0.07017	0.03083	0.43927
81	0.00422	0.07329	0.03665	0.47762	0.02472	0.04945	2.09373	1.99877	0.05523	0.02118	0.03751	0.10115	1.79487	0.50190	1.87130	0.43821	0.10585	0.05075	0.47947
82	0.00328	0.06467	0.03233	0.61224	0.02469	0.04938	1.63333	1.87204	0.04439	0.02064	0.03346	0.08635	2.24836	0.43184	2.27639	0.51209	0.08798	0.04753	0.54023
83	0.00684	0.09331	0.04665	0.31648	0.02564	0.05127	3.15973	2.82651	0.07747	0.00990	0.04612	0.15322	1.85729	0.55668	1.96939	0.45477	0.14469	0.06017	0.41589
84	0.03485	0.21066	0.10533	0.24117	0.05112	0.10224	4.14644	3.02509	0.19647	0.02048	0.10047	0.36210	1.01399	0.45859	1.33373	0.62546	0.38707	0.11465	0.29620
85	0.00928	0.10872	0.05436	0.27932	0.02811	0.05622	3.58016	1.93092	0.07665	0.01621	0.05304	0.14782	2.11588	0.58343	2.21397	0.47515	0.15597	0.07578	0.48588
86	0.00025	0.01790	0.00895	0.61596	0.00641	0.01281	1.62347	2.92661	0.01408	0.00472	0.00983	0.02793	2.23690	0.45477	2.24454	0.48024	0.03029	0.01057	0.34915
87	0.00293	0.06110	0.03055	0.67404	0.02448	0.04896	1.48359	1.81716	0.04314	0.02281	0.03116	0.08038	0.34776	0.53375	0.37579	0.45986	0.07639	0.04887	0.63972
88	0.00093	0.03450	0.01725	0.80886	0.01491	0.02982	1.23631	1.44171	0.02033	0.01220	0.01740	0.03981	1.43054	0.49171	1.46112	0.46878	0.03979	0.02991	0.75178
89	0.00110	0.03746	0.01873	0.61596	0.01410	0.02820	1.62348	1.93252	0.02944	0.01366	0.01955	0.04995	0.00255	0.52993	0.00764	0.48152	0.05092	0.02755	0.54101
90	0.01146	0.12078	0.06039	0.46013	0.04036	0.08071	2.17329	2.37222	0.09571	0.02258	0.06321	0.18326	0.56050	0.59234	0.70827	0.48661	0.18606	0.07841	0.42140
91	0.00059	0.02735	0.01367	0.55012	0.00954	0.01907	1.81780	3.11725	0.02340	0.00624	0.01479	0.04540	2.44326	0.52356	2.46874	0.48789	0.04602	0.01625	0.35309
92	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.43401	0.25095	1.44456	0.25859	0.01127	0.00898	0.79709
93	0.00962	0.11067	0.05534	0.30991	0.03020	0.06039	3.22673	3.30042	0.10419	0.00312	0.05840	0.19709	0.13885	0.59744	0.31846	0.51973	0.20386	0.06008	0.29470
94	0.00398	0.07121	0.03560	0.70790	0.02934	0.05869	1.41262	1.57740	0.04470	0.02565	0.03594	0.08761	0.03185	0.57324	0.08662	0.50700	0.08602	0.05894	0.68519
95	0.01516	0.13893	0.06947	0.43584	0.04524	0.09049	2.29440	2.35876	0.10834	0.03722	0.07355	0.21050	0.78724	0.52228	0.99106	0.56942	0.21732	0.08882	0.40870
96	0.00236	0.05483	0.02741	0.17824	0.01097	0.02194	5.61032	2.46023	0.04240	0.00081	0.02618	0.08151	2.36046	0.53884	2.43689	0.51464	0.09167	0.03279	0.35774
97	0.00041	0.02291	0.01145	0.64822	0.00862	0.01724	1.54267	2.59502	0.01760	0.00486	0.01219	0.03450	1.97321	0.52228	1.98595	0.55285	0.03658	0.01435	0.39222
98	0.00226	0.05369	0.02684	0.47919	0.01797	0.03593	2.08685	3.09342	0.04602	0.01002	0.02819	0.09129	2.42161	0.65094	2.46874	0.57451	0.08775	0.03284	0.37429
99	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.43401	0.25095	1.44456	0.25859	0.01127	0.00898	0.79709
100	0.00169	0.04644	0.02322	0.55937	0.01674	0.03348	1.78773	1.78183	0.03192	0.01357	0.02350	0.05976	2.36683	0.60763	2.42415	0.59617	0.05973	0.03611	0.60458
101	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.43401	0.25095	1.44456	0.25859	0.01127	0.00898	0.79709
102	0.00009	0.01076	0.0																



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-33 12.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸X	絶対最大長軸Y	絶対最大短軸X	絶対最大短軸Y	楕円長軸	楕円短軸	楕円長短比
103	0.00447	0.07543	0.03772	0.64375	0.02965	0.05930	1.55340	1.50799	0.04803	0.02930	0.03778	0.09076	0.78979	0.68661	0.84329	0.61527	0.08858	0.06424	0.72517
104	0.00829	0.10273	0.05137	0.23948	0.02453	0.04905	4.17569	2.49208	0.08691	0.02240	0.05090	0.15823	1.94136	0.61782	2.06238	0.71718	0.16153	0.06533	0.40446
105	0.00756	0.09810	0.04905	0.48583	0.03359	0.06719	2.05834	2.26167	0.08796	0.02550	0.05307	0.14497	0.54012	0.61782	0.68151	0.64330	0.14629	0.06579	0.44973
106	0.00019	0.01568	0.00784	0.81015	0.00644	0.01287	1.23435	2.28479	0.01085	0.00533	0.00800	0.02162	0.03312	0.62929	0.04713	0.61527	0.01938	0.01269	0.65471
107	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.45347	0.61910	1.46112	0.62674	0.01127	0.00898	0.79709
108	0.00088	0.03346	0.01673	0.35845	0.00940	0.01881	2.78977	3.21367	0.02928	0.00498	0.01775	0.05631	0.48152	0.67515	0.49426	0.62164	0.05897	0.01899	0.32200
109	0.00044	0.02375	0.01187	0.62157	0.00874	0.01748	1.60882	2.35525	0.01732	0.00642	0.01224	0.03403	0.00637	0.65349	0.02293	0.62546	0.03299	0.01710	0.51826
110	0.00809	0.10150	0.05075	0.35600	0.02967	0.05935	2.80899	1.60931	0.07002	0.01514	0.04821	0.12618	1.52608	0.63566	1.60124	0.73502	0.13578	0.07587	0.55878
111	0.00014	0.01356	0.00678	0.74035	0.00521	0.01042	1.35071	2.42268	0.00948	0.00415	0.00688	0.01885	0.03439	0.63183	0.04586	0.64457	0.01743	0.01055	0.60557
112	0.00831	0.10286	0.05143	0.36358	0.03040	0.06079	2.75040	3.06660	0.09206	0.02207	0.05634	0.17655	2.24709	0.64585	2.36810	0.77196	0.18040	0.05865	0.32511
113	0.00612	0.08830	0.04415	0.19378	0.01882	0.03764	5.16043	1.89652	0.06037	0.01668	0.04264	0.11776	1.31590	0.64330	1.37195	0.74521	0.12649	0.06165	0.48739
114	0.00310	0.06284	0.03142	0.44248	0.02030	0.04059	2.26001	2.34531	0.04757	0.01016	0.03239	0.09346	1.06495	0.73502	1.11208	0.65604	0.10447	0.03779	0.36174
115	0.00068	0.02946	0.01473	0.51398	0.00995	0.01990	1.94560	3.34306	0.02632	0.00459	0.01623	0.05076	2.09168	0.66750	2.12098	0.70699	0.05097	0.01703	0.33404
116	0.00050	0.02535	0.01267	0.42714	0.00767	0.01534	2.34113	2.99633	0.02117	0.00244	0.01276	0.04062	0.24585	0.70062	0.27006	0.67005	0.03981	0.01614	0.40535
117	0.00052	0.02575	0.01288	0.43050	0.00784	0.01568	2.32289	2.87834	0.02080	0.00392	0.01345	0.04055	0.49426	0.67260	0.50317	0.71081	0.04422	0.01500	0.33919
118	0.00031	0.01971	0.00985	0.67576	0.00750	0.01499	1.47982	2.48920	0.01477	0.00425	0.01012	0.02878	0.51464	0.67769	0.53502	0.69553	0.02839	0.01368	0.48186
119	0.00253	0.05672	0.02836	0.58539	0.02109	0.04218	1.70827	1.99253	0.04111	0.01813	0.02912	0.07782	1.68149	0.73247	1.74137	0.68534	0.07691	0.04183	0.54386
120	0.00025	0.01801	0.00901	0.64849	0.00664	0.01327	1.54205	2.47750	0.01333	0.00403	0.00940	0.02594	0.54012	0.70827	0.55158	0.68661	0.02712	0.01196	0.44114
121	0.01157	0.12138	0.06069	0.52834	0.04351	0.08702	1.89271	2.07478	0.09765	0.03652	0.06266	0.17245	0.76941	0.69935	0.85094	0.84966	0.08736	0.05198	0.51798
122	0.00103	0.03614	0.01807	0.81590	0.01571	0.03142	1.22564	1.37626	0.02074	0.01573	0.01823	0.04080	2.22671	0.71973	2.26110	0.70062	0.03965	0.03293	0.83060
123	0.00114	0.03803	0.01901	0.51490	0.01305	0.02609	1.94213	3.07372	0.03302	0.00684	0.02056	0.06375	2.13117	0.69553	2.16683	0.74648	0.06541	0.02211	0.33801
124	0.00476	0.07787	0.03894	0.66058	0.03103	0.06206	1.51382	1.78333	0.05225	0.02453	0.03944	0.10197	0.32356	0.70317	0.40509	0.76177	0.09991	0.06069	0.60746
125	0.00500	0.07980	0.03990	0.59502	0.03017	0.06033	1.68061	1.50411	0.04961	0.02459	0.03969	0.09593	2.43944	0.77833	2.51332	0.71973	0.10002	0.06367	0.63658
126	0.00010	0.01141	0.00570	0.85549	0.00465	0.00931	1.16892	2.02861	0.00717	0.00446	0.00585	0.01433	0.52738	0.70190	0.53757	0.70954	0.01363	0.00955	0.70090
127	0.00216	0.05246	0.02623	0.69917	0.02133	0.04265	1.43026	1.71911	0.03431	0.01955	0.02663	0.06688	1.39360	0.75540	1.43437	0.70444	0.06488	0.04241	0.65370
128	0.00501	0.07986	0.03993	0.40225	0.02471	0.04941	2.48599	1.75105	0.05559	0.02259	0.04004	0.10310	0.26747	0.71463	2.14645	0.77833	0.11013	0.05792	0.52590
129	0.00134	0.04136	0.02068	0.65053	0.01608	0.03216	1.53721	2.25866	0.03296	0.01219	0.02144	0.05992	2.19486	0.78724	2.22925	0.74011	0.05871	0.02914	0.49634
130	0.00231	0.05418	0.02709	0.35112	0.01543	0.03087	2.84803	2.47216	0.04278	0.01268	0.02855	0.08191	2.52352	0.75922	2.59995	0.78470	0.08532	0.03441	0.40328
131	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	0.05031	0.78088	0.55795	0.78852	0.01127	0.00898	0.79709
132	0.00184	0.04838	0.02419	0.38737	0.01445	0.02890	2.58150	2.46722	0.03760	0.00952	0.02392	0.07293	1.86748	0.83947	1.90824	0.78088	0.07384	0.03170	0.42928
133	0.00604	0.08770	0.04385	0.28589	0.02284	0.04567	3.49786	3.13964	0.08122	0.00888	0.04411	0.15135	2.33626	0.93501	2.38976	0.79489	0.16104	0.04777	0.29662
134	0.00013	0.01269	0.00635	0.88635	0.00537	0.01074	1.12822	1.80074	0.00799	0.00503	0.00647	0.01531	0.16815	0.80253	0.17579	0.81400	0.01480	0.01089	0.73545
135	0.00009	0.01076	0.00538	0.87656	0.00441	0.00882	1.14083	2.02780	0.00671	0.00452	0.00550	0.01342	0.18089	0.81145	0.18853	0.82037	0.01234	0.00938	0.76013
136	0.00456	0.07621	0.03810	0.40639	0.02368	0.04736	2.46072	3.63395	0.07638	0.01384	0.04425	0.14163	0.22420	0.95030	0.24458	0.81145	0.14099	0.04119	0.29218
137	0.00018	0.01521	0.00761	0.77134	0.00605	0.01211	1.29645	2.24528	0.01044	0.00513	0.00772	0.02066	0.12866	0.82546	1.42627	0.81272	0.01873	0.01235	0.65955
138	0.01482	0.13734	0.06867	0.28995	0.03637	0.07274	3.44884	1.68802	0.09158	0.02673	0.06504	0.17550	0.050827	0.84966	0.67132	0.91081	0.18255	0.10333	0.56607
139	0.00250	0.05646	0.02823	0.36068	0.01634	0.03267	2.77252	3.17920	0.04873	0.00366	0.02999	0.09700	1.19615	0.84839	1.29042	0.83183	0.11246	0.02835	0.25206
140	0.00053	0.02603	0.01302	0.44168	0.00804	0.01607	2.26407	2.24345	0.02086	0.00423	0.01284	0.03622	0.10191	0.85349	0.13248	0.83693	0.03858	0.01757	0.45535
141	0.01318	0.12953	0.06476	0.45559	0.04310	0.08620	2.19497	1.73835	0.08914	0.04351	0.06606	0.16838	1.30061	0.86240	1.45602	0.92355	0.17265	0.09717	0.56286
142	0.00018	0.01508	0.00754	0.67468	0.00557	0.01114	1.48219	2.55864	0.01094	0.00325	0.00773	0.02169	0.14649	0.85094	0.16305	0.86240	0.02128	0.01068	0.50191
143	0.00015	0.01379	0.00689	0.85573	0.00576	0.01152	1.16859	2.29347	0.00945	0.00501	0.00708	0.01885	0.08662	0.86368	0.09936	0.85221	0.01691	0.01124	0.66448
144	0.00009	0.01076	0.00538	0.87656	0.00441	0.00882	1.14083	2.02780	0.00671	0.00452	0.00550	0.01342	1.43819	0.85349	1.44710	0.86113	0.01234	0.00938	0.76013
145	0.00036	0.02142	0.01071	0.42998	0.00640	0.01280	2.32567	2.73310	0.01630	0.00184	0.01040	0.03228	0.10446	0.85603	0.13121	0.87132	0.03235	0.01418	0.43837
146	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	0.16942	0.85603	0.17707	0.86368	0.01127	0.00898	0.79709
147	0.00710	0.09509	0.04754	0.25935	0.02359	0.04719	3.85581	3.04364	0.09143	0.02381	0.05155	0.16164	2.37320	0.94648	2.50950	0.86240	0.15964	0.05663	0.35476
148	0.00079	0.03166	0.01583	0.60055	0.01166	0.02333	1.66515	2.75688	0.02538	0.01065	0.01706	0.04998	1.08151	0.90189	1.10571	0.85985	0.04773	0.02099	0.43980
149	0.02079	0.16269	0.08135	0.42919	0.05268	0.10537	2.32997	2.84842	0.13948	0.01724	0.08511	0.27145	1.11845	1.12864	1.16431	0.86240	0.29118	0.09090	0.31218
150	0.00415	0.07270	0.03635	0.50885	0.02532	0.05064	1.96523	1.92655	0.05051	0.01955	0.03705	0.09853	1.21526	0.94011	1.27641	0.86495	0.10271	0.05146	0.50097
151	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	0.14522	0.86622	0.15286	0.87387	0.01127	0.00898	0.79709
152	0.00054	0.02627	0.01313	0.48600	0.00854	0.01708	2.05759	2.37814	0.01948	0.00828	0.01348	0.03778	0.15541	0.86750	0.16305	0.90317	0.03835	0.01799	0.4691



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-33 12.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾角X	絶対最大長傾角Y	絶対最大長傾角Z	絶対最大長傾角V	精円長軸	精円短軸	精円長短比
154	0.00013	0.01294	0.00647	0.90674	0.00556	0.01112	1.10285	2.13024	0.00852	0.00572	0.00665	0.01704	1.58850	0.88278	1.59869	0.87132	0.01497	0.01118	0.74692
155	0.00306	0.06242	0.03121	0.43206	0.01990	0.03980	2.31452	1.94324	0.05084	0.01700	0.03181	0.08441	1.85531	0.87259	1.91461	0.95030	0.08584	0.04539	0.52881
156	0.00858	0.10450	0.05225	0.48876	0.03592	0.07183	2.04600	1.77656	0.07536	0.03574	0.05296	0.13695	0.91463	0.89552	1.01399	0.98724	0.13255	0.08238	0.62147
157	0.00245	0.05587	0.02794	0.55652	0.02022	0.04044	1.79689	1.66585	0.03757	0.01820	0.02809	0.06997	1.57449	0.91463	1.63818	0.88915	0.07068	0.04417	0.62490
158	0.00091	0.03408	0.01704	0.35032	0.00947	0.01894	2.85451	2.34241	0.02823	0.00475	0.01722	0.04897	0.10700	0.91973	0.13503	0.88151	0.05423	0.02141	0.39484
159	0.00250	0.05644	0.02822	0.44488	0.01820	0.03641	2.24782	1.80627	0.03706	0.01406	0.02770	0.07336	1.51971	0.88151	1.55538	0.94393	0.07221	0.04412	0.61099
160	0.00014	0.01341	0.00670	0.89387	0.00573	0.01145	1.11873	1.98022	0.00853	0.00571	0.00683	0.01704	0.32866	0.89043	0.34012	0.90062	0.01517	0.01185	0.78154
161	0.00078	0.03159	0.01580	0.76924	0.01325	0.02650	1.29999	1.65038	0.02110	0.01138	0.01592	0.03882	1.66366	0.93756	1.69296	0.91463	0.03724	0.02680	0.71948
162	0.00036	0.02132	0.01066	0.51955	0.00707	0.01413	1.92476	2.52911	0.01681	0.00499	0.01099	0.03118	1.83308	0.91718	1.84327	0.94520	0.03209	0.01417	0.44147
163	0.01847	0.15337	0.07669	0.37572	0.04639	0.09279	2.66158	1.71844	0.10659	0.03122	0.07406	0.19844	1.68532	1.12227	1.76047	0.94011	0.20101	0.11702	0.58218
164	0.00157	0.04468	0.02234	0.40483	0.01362	0.02723	2.47018	3.43089	0.04393	0.00816	0.02491	0.07927	1.84582	0.95157	1.89805	1.00890	0.08476	0.02355	0.27782
165	0.00031	0.01997	0.00998	0.62815	0.00731	0.01461	1.59197	1.98424	0.01392	0.00329	0.00993	0.02597	2.13117	0.97450	2.14008	0.95157	0.02795	0.01427	0.51039
166	0.00095	0.03480	0.01740	0.67765	0.01371	0.02742	1.47568	1.89988	0.02373	0.01198	0.01793	0.04591	1.80251	0.95412	1.83436	0.98469	0.04596	0.02634	0.57315
167	0.00301	0.06194	0.03097	0.35874	0.01794	0.03588	2.78753	2.47648	0.04994	0.01260	0.03140	0.09427	2.31970	1.06367	2.33498	0.97195	0.09934	0.03862	0.38875
168	0.00039	0.02231	0.01116	0.68489	0.00862	0.01724	1.46009	2.41486	0.01654	0.00582	0.01180	0.03237	1.66111	1.03183	1.67130	1.00253	0.03334	0.01493	0.44795
169	0.01344	0.13080	0.06540	0.55589	0.04815	0.09630	1.79891	1.50701	0.08378	0.03540	0.06495	0.15856	1.26112	1.04584	1.39615	1.12609	0.16363	0.10455	0.63892
170	0.00241	0.05537	0.02769	0.24021	0.01295	0.02591	4.16303	4.73071	0.06214	0.00167	0.03424	0.11498	1.46239	1.12864	1.50061	1.02164	0.13055	0.02349	0.17989
171	0.00719	0.09567	0.04784	0.58759	0.03606	0.07213	1.70187	1.92634	0.06791	0.02796	0.04945	0.13060	0.88915	1.12609	0.98087	1.03565	0.12867	0.07113	0.55284
172	0.00176	0.04739	0.02370	0.25450	0.01134	0.02267	3.92929	2.92285	0.04513	0.00383	0.02571	0.07683	0.62037	1.06240	0.69043	1.09042	0.08781	0.02558	0.29127
173	0.00427	0.07377	0.03689	0.51845	0.02595	0.05190	1.92881	1.90305	0.05323	0.01853	0.03706	0.09944	0.27898	1.14520	0.35923	1.08915	0.10378	0.05244	0.50533
174	0.00252	0.05668	0.02834	0.55476	0.02050	0.04099	1.80258	1.77395	0.03977	0.01385	0.02878	0.07330	0.21019	1.08915	0.28025	1.10571	0.07567	0.04246	0.56113
175	0.00038	0.02213	0.01106	0.64755	0.00828	0.01656	1.54428	1.96720	0.01489	0.00613	0.01111	0.02887	0.60381	1.08278	0.62037	1.10444	0.02926	0.01673	0.57183
176	0.00023	0.01707	0.00853	0.37569	0.00462	0.00924	2.66178	2.79887	0.01312	0.00118	0.00794	0.02522	0.63948	1.09552	0.65604	1.11208	0.02610	0.01116	0.42781
177	0.00921	0.10828	0.05414	0.63713	0.04261	0.08522	1.56953	1.62979	0.07547	0.00478	0.05519	0.13630	0.75158	1.15794	0.88024	1.19870	0.13415	0.08740	0.65154
178	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	0.62674	1.10698	0.63438	1.11463	0.01127	0.00898	0.79709
179	0.01483	0.13743	0.06872	0.36083	0.04067	0.08134	2.77137	1.75692	0.09265	0.00463	0.06267	0.17948	1.40634	1.14393	1.51589	1.28405	0.18290	0.10327	0.56464
180	0.00687	0.09353	0.04677	0.62724	0.03644	0.07287	1.59429	1.71324	0.06361	0.03655	0.04779	0.12043	1.15412	1.14010	1.16686	1.25857	0.11548	0.07575	0.65597
181	0.00231	0.05420	0.02710	0.54424	0.01939	0.03877	1.83743	2.80705	0.04662	0.01551	0.02942	0.08806	0.43056	1.18342	0.50954	1.14775	0.08603	0.03415	0.39695
182	0.00015	0.01394	0.00697	0.84266	0.00579	0.01158	1.18672	1.95079	0.00900	0.00505	0.00714	0.01741	0.09681	1.14775	0.10446	1.16176	0.01760	0.01103	0.62685
183	0.01839	0.15301	0.07651	0.21567	0.03492	0.06984	4.63665	2.95585	0.15319	0.00965	0.08491	0.25854	0.14522	1.16686	0.21656	1.41398	0.29427	0.07956	0.27037
184	0.00535	0.08256	0.04128	0.37420	0.02464	0.04927	2.67239	1.92725	0.05755	0.01767	0.04031	0.11182	0.95539	1.16686	1.01272	1.26112	0.10914	0.06245	0.57222
185	0.00046	0.02422	0.01211	0.63272	0.00901	0.01802	1.58047	1.94943	0.01672	0.00573	0.01216	0.03164	2.41396	1.18087	2.44071	1.16686	0.03221	0.01821	0.56542
186	0.00291	0.06086	0.03043	0.66923	0.02428	0.04855	1.49425	1.70372	0.04055	0.02189	0.03119	0.07747	2.25091	1.21654	2.30696	1.26749	0.07579	0.04888	0.64494
187	0.02800	0.18881	0.09440	0.22878	0.04454	0.08908	4.37100	2.10014	0.13563	0.03293	0.09238	0.26988	2.52097	1.22163	2.54517	1.48914	0.25856	0.13787	0.53324
188	0.00030	0.01939	0.00970	0.67719	0.00735	0.01470	1.47669	1.58478	0.01189	0.00713	0.00974	0.02249	2.54008	1.22163	2.54899	1.24074	0.02313	0.01626	0.70274
189	0.00844	0.10365	0.05183	0.50101	0.03607	0.07215	1.99598	2.82311	0.10250	0.02964	0.05830	0.17126	0.00255	1.42035	0.04076	1.25475	0.16207	0.06629	0.40901
190	0.02768	0.18773	0.09387	0.44062	0.06189	0.12339	2.26951	1.85583	0.13253	0.06766	0.09610	0.25323	1.95792	1.32991	2.20632	1.37195	0.24223	0.14550	0.60065
191	0.00009	0.01076	0.00538	0.87656	0.00441	0.00882	1.14083	2.02780	0.00671	0.00452	0.00550	0.01342	0.71336	1.30316	0.72100	1.31207	0.01234	0.00938	0.76013
192	0.00338	0.06560	0.03280	0.41077	0.02041	0.04083	2.43447	2.95343	0.06013	0.01495	0.03552	0.10947	0.62801	1.37322	0.72865	1.33373	0.10833	0.03973	0.36676
193	0.02095	0.16333	0.08166	0.48700	0.05638	0.11275	2.05337	1.94986	0.12873	0.03883	0.08306	0.22561	0.25477	1.33500	0.43821	1.46366	0.22250	0.11989	0.53884
194	0.00065	0.02882	0.01441	0.69303	0.01139	0.02278	1.44294	2.47309	0.02185	0.00981	0.01525	0.04304	1.17577	1.35539	1.19233	1.31717	0.04291	0.01936	0.45115
195	0.01437	0.13528	0.06764	0.51699	0.04802	0.09604	1.93427	2.57351	0.11549	0.04201	0.07166	0.21427	1.70952	1.41016	1.91461	1.35284	0.20039	0.09133	0.45574
196	0.00347	0.06651	0.03325	0.58168	0.02475	0.04950	1.71917	1.88888	0.04554	0.02503	0.03395	0.08920	0.99106	1.40125	1.04966	1.33628	0.08248	0.05363	0.65028
197	0.00034	0.02068	0.01034	0.45153	0.00633	0.01267	2.21467	3.79800	0.01892	0.00358	0.01171	0.03674	0.96559	1.37449	0.98087	1.34265	0.03916	0.01092	0.27884
198	0.00913	0.10784	0.05392	0.35373	0.03146	0.06293	2.82704	3.28282	0.10833	0.02204	0.05847	0.19170	1.13628	1.36048	1.22036	1.53118	0.20050	0.05800	0.28930
199	0.00009	0.01076	0.00538	0.87656	0.00441	0.00882	1.14083	2.02780	0.00671	0.00452	0.00550	0.01342	1.22036	1.36176	1.22800	1.37067	0.01234	0.00938	0.76013
200	0.00016	0.01437	0.00719	0.91444	0.00626	0.01252	1.09356	1.89253	0.00930	0.00619	0.00734	0.01802	1.24074	1.38723	1.25220	1.37577	0.01611	0.01283	0.79625
201	0.00414	0.07260	0.03630	0.50190	0.02510	0.05021	1.99242	1.72977	0.04883	0.01217	0.03535	0.09321	0.88151	1.41016	0.96813	1.44073	0.09743	0.05410	0.55524
202	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.24074	1.40125	1.24838	1.40889	0.01127	0.00898	0.79709
203	0.00016	0.01437	0.00719	0.75978	0.00566	0.01131	1.31618	2.35245	0.01005	0.00443	0.00749	0.01990	1.23182	1.42927	1.24201	1.41398	0.01955	0.01057	0.54032



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-33 12.7m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾点X	絶対最大長傾点Y	絶対最大長傾点X	絶対最大長傾点Y	楕円長軸	楕円短軸	楕円長短比
205	0.00016	0.01430	0.00715	0.81683	0.00585	0.01169	1.22425	2.13478	0.00947	0.00504	0.00737	0.01890	1.04456	1.45729	1.05476	1.44328	0.01794	0.01140	0.63582
206	0.00165	0.04586	0.02293	0.54763	0.01636	0.03272	1.82606	1.61177	0.03093	0.01303	0.02297	0.05613	1.30953	1.44328	1.35284	1.47640	0.05967	0.03525	0.59065
207	0.00029	0.01923	0.00962	0.70750	0.00748	0.01495	1.41343	2.30119	0.01406	0.00615	0.00982	0.02697	2.49549	1.44583	2.51205	1.46494	0.02519	0.01468	0.58297
208	0.00010	0.01141	0.00570	0.85549	0.00465	0.00931	1.16892	2.02861	0.00717	0.00446	0.00585	0.01433	1.03183	1.44965	1.03947	1.45984	0.01363	0.00955	0.70090
209	0.00155	0.04447	0.02223	0.64276	0.01721	0.03443	1.55578	2.48369	0.03474	0.01407	0.02344	0.06768	0.52610	1.45729	0.55922	1.51462	0.06524	0.03031	0.46453
210	0.00612	0.08824	0.04412	0.68500	0.03590	0.07181	1.45985	1.80257	0.05876	0.03381	0.04462	0.11649	1.02673	1.53882	1.11463	1.46494	0.10629	0.07326	0.68924
211	0.02987	0.19501	0.09750	0.26359	0.04944	0.09888	3.79379	1.82208	0.13211	0.03999	0.09531	0.25998	1.90187	1.46621	1.93881	1.72226	0.25901	0.14683	0.56688
212	0.00316	0.06344	0.03172	0.46986	0.02113	0.04225	2.12828	2.86805	0.05527	0.01926	0.03388	0.10439	0.00255	1.55538	0.05605	1.46749	0.09121	0.04413	0.48380
213	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.91843	1.47131	1.92608	1.47895	0.01127	0.00898	0.79709
214	0.00153	0.04416	0.02208	0.52414	0.01540	0.03079	1.90788	3.39807	0.04129	0.01042	0.02444	0.07840	0.06879	1.48405	0.12611	1.53500	0.07834	0.02490	0.31779
215	0.00464	0.07683	0.03842	0.48168	0.02606	0.05212	2.07608	2.83025	0.06555	0.01726	0.04150	0.12634	1.32227	1.60124	1.37195	1.48659	0.13362	0.04418	0.33062
216	0.05363	0.26132	0.13066	0.19379	0.05691	0.11381	5.16024	2.76845	0.22190	0.01420	0.13199	0.43017	0.58470	1.55538	0.97578	1.73117	0.49165	0.13889	0.28251
217	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.91843	1.47131	1.92608	1.47895	0.01127	0.00898	0.79709
218	0.00597	0.08717	0.04359	0.54183	0.03147	0.06294	1.84559	1.96828	0.06291	0.02928	0.04456	0.11997	0.45623	1.52863	0.55540	1.60634	0.11567	0.06570	0.56794
219	0.05481	0.26418	0.13209	0.38844	0.08171	0.16341	2.57442	1.97177	0.19321	0.05334	0.13419	0.36817	2.17703	1.68786	2.54135	1.64455	0.39364	0.17729	0.45039
220	0.00528	0.08202	0.04101	0.40243	0.02540	0.05080	2.48488	2.33951	0.06289	0.01632	0.04180	0.12249	0.02420	1.54264	0.10828	1.62927	0.12070	0.05574	0.46178
221	0.00394	0.07087	0.03544	0.53522	0.02531	0.05062	1.86839	1.51704	0.04513	0.02327	0.03558	0.08522	0.30445	1.56303	0.34394	1.63691	0.08630	0.05820	0.67447
222	0.00469	0.07730	0.03865	0.41559	0.02430	0.04859	2.40621	2.67978	0.06641	0.02074	0.04170	0.12339	0.99234	1.66366	1.07768	1.57704	0.11816	0.05057	0.42796
223	0.01131	0.12000	0.06000	0.59151	0.04553	0.09105	1.69058	1.50612	0.07384	0.04750	0.06015	0.14529	0.14395	1.60124	0.17707	1.74137	0.14118	0.10200	0.72247
224	0.00019	0.01555	0.00777	0.48717	0.00481	0.00962	2.05269	3.34648	0.01270	0.00168	0.00796	0.02522	2.16811	1.63691	2.18467	1.65347	0.02635	0.00917	0.34812
225	0.00928	0.10868	0.05434	0.42692	0.03489	0.06978	2.34235	2.40061	0.09805	0.03257	0.05759	0.16547	0.00255	1.80124	0.09172	1.66366	0.12698	0.07248	0.44471
226	0.02953	0.19389	0.09695	0.29921	0.05241	0.10482	3.34217	2.67610	0.16251	0.04874	0.10045	0.31348	1.56685	1.87257	1.78340	1.64837	0.29475	0.12755	0.43272
227	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.91843	1.47131	1.92608	1.47895	0.01127	0.00898	0.79709
228	0.00010	0.01141	0.00570	0.85549	0.00465	0.00931	1.16892	2.02861	0.00717	0.00446	0.00585	0.01433	1.03183	1.44965	1.03947	1.45984	0.01363	0.00955	0.70090
229	0.00046	0.02422	0.01211	0.75576	0.00991	0.01982	1.32316	1.92735	0.01599	0.00857	0.01231	0.03165	1.51462	1.69423	1.53882	1.67640	0.03060	0.01918	0.62673
230	0.00009	0.01076	0.00538	0.87656	0.00441	0.00882	1.14083	2.02780	0.00671	0.00452	0.00550	0.01342	0.84712	1.68659	0.85603	1.69423	0.01234	0.00938	0.76013
231	0.00031	0.01976	0.00988	0.51273	0.00646	0.01292	1.95035	2.44222	0.01491	0.00393	0.01014	0.02819	1.52608	1.69933	1.55029	1.71079	0.03023	0.01292	0.42722
232	0.05112	0.25512	0.12756	0.53917	0.09305	0.18610	1.85469	1.53081	0.16198	0.08412	0.12934	0.31357	1.91334	1.95283	2.10696	1.70825	0.31811	0.20461	0.64323
233	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.91843	1.47131	1.92608	1.47895	0.01127	0.00898	0.79709
234	0.01477	0.13713	0.06856	0.58583	0.05186	0.10373	1.70698	2.03191	0.09873	0.04347	0.07025	0.19318	1.25985	1.72353	1.30698	1.90951	0.18378	0.10232	0.55675
235	0.00430	0.07397	0.03698	0.36060	0.02159	0.04319	2.77315	3.48828	0.07826	0.01444	0.04418	0.13432	0.40381	1.74391	0.53120	1.78213	0.14120	0.03875	0.27440
236	0.00012	0.01236	0.00618	0.86359	0.00513	0.01026	1.15795	2.13647	0.00807	0.00515	0.00636	0.01614	1.55283	1.72990	1.56175	1.74137	0.01481	0.01032	0.69685
237	0.00012	0.01220	0.00610	0.86187	0.00504	0.01007	1.16026	1.97060	0.00762	0.00510	0.00623	0.01523	1.51589	1.73882	1.52481	1.74901	0.01404	0.01059	0.75454
238	0.00017	0.01473	0.00736	0.70848	0.00558	0.01115	1.41147	2.46085	0.01039	0.00446	0.00779	0.02079	1.53882	1.75920	1.54647	1.77703	0.02220	0.00977	0.44000
239	0.00114	0.03803	0.01901	0.22143	0.00834	0.01667	4.51604	6.29570	0.04840	0.00134	0.02523	0.08889	1.51334	1.86111	1.54519	1.77958	0.10309	0.01403	0.13609
240	0.00009	0.01076	0.00538	0.87656	0.00441	0.00882	1.14083	2.02780	0.00671	0.00452	0.00550	0.01342	2.49294	1.77958	2.50186	1.78722	0.01234	0.00938	0.76013
241	0.01075	0.11701	0.05851	0.33766	0.03338	0.06675	2.96156	1.31971	0.06983	0.02272	0.05410	0.13197	2.46874	1.88786	2.59103	1.84200	0.13889	0.09858	0.70977
242	0.00008	0.01006	0.00503	0.89219	0.00413	0.00826	1.12083	2.08024	0.00631	0.00446	0.00515	0.01261	1.91843	1.47131	1.92608	1.47895	0.01127	0.00898	0.79709
243	0.00536	0.08265	0.04132	0.46487	0.02755	0.05511	2.15115	1.86706	0.06023	0.02415	0.04122	0.11044	1.11590	1.91588	1.15794	1.81525	0.10928	0.06251	0.57202
244	0.00027	0.01858	0.00929	0.68340	0.00707	0.01413	1.46327	2.36229	0.01377	0.00384	0.00944	0.02628	1.43946	1.83054	1.45984	1.84455	0.02629	0.01312	0.49914
245	0.00028	0.01880	0.00940	0.77572	0.00766	0.01532	1.28912	2.09246	0.01309	0.00607	0.00953	0.02517	1.47003	1.83181	1.48787	1.84710	0.02333	0.01514	0.64906
246	0.00061	0.02787	0.01394	0.49425	0.00919	0.01837	2.02326	3.21505	0.02383	0.00641	0.01508	0.04686	1.47640	1.88786	1.51080	1.85856	0.04596	0.01690	0.36779
247	0.00949	0.10991	0.05496	0.42590	0.03524	0.07047	2.34796	2.20613	0.08403	0.03376	0.05715	0.16039	2.14518	1.93117	2.30314	1.95028	0.16862	0.07164	0.42489
248	0.00037	0.02166	0.01083	0.54992	0.00743	0.01487	1.81846	2.47004	0.01736	0.00296	0.01094	0.03151	1.44710	1.90569	1.47003	1.88659	0.03277	0.01431	0.43679
249	0.00509	0.08051	0.04025	0.33349	0.02263	0.04526	2.99860	2.27451	0.06961	0.01093	0.04062	0.11821	1.31717	1.95283	1.42163	1.90060	0.12194	0.05315	0.43585
250	0.00585	0.08629	0.04315	0.20325	0.01882	0.03765	4.92002	6.92822	0.11754	0.00803	0.06203	0.21981	1.43437	1.95283	1.65092	1.92353	0.23288	0.03197	0.13730
251	0.00190	0.04923	0.02461	0.52836	0.01728	0.03455	1.89266	3.06719	0.04525	0.01354	0.02706	0.08324	1.68532	1.95283	1.76557	1.93627	0.07988	0.03034	0.37984
252	0.00005	0.00813	0.00407	0.77984	0.00298	0.00595	1.28232	2.70445	0.00554	0.00269	0.00429	0.01109	1.77066	1.94900	1.77958	1.95283	0.01170	0.00565	0.48326



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-39 13.5m

番号	面積	円相直径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾点X	絶対最大長傾点Y	絶対最大長傾点X	絶対最大長傾点Y	楕円長軸	楕円短軸	楕円長短比
1	0.00003	0.00610	0.00305	0.69813	0.00255	0.00510	1.43239	1.82212	0.00412	0.00214	0.00321	0.00823	0.88406	0.00382	0.89043	0.00637	0.00863	0.00431	0.49945
2	0.00309	0.06275	0.03138	0.53752	0.02240	0.04480	1.86038	1.95369	0.04592	0.02085	0.03288	0.08540	1.18214	0.00382	1.23182	0.07134	0.08750	0.04501	0.51437
3	0.00577	0.08573	0.04286	0.57749	0.03197	0.06395	1.73164	2.46466	0.07836	0.02418	0.04669	0.13211	1.41271	0.00637	1.54264	0.02166	0.13289	0.05530	0.41614
4	0.00970	0.11111	0.05555	0.67884	0.04517	0.09035	1.47311	1.92252	0.08442	0.04454	0.05726	0.15205	1.62672	0.00382	1.75156	0.08790	0.13683	0.09022	0.65939
5	0.00061	0.02784	0.01392	0.42057	0.00843	0.01686	2.37772	4.67257	0.02889	0.00618	0.01693	0.05619	1.80633	0.00764	1.86111	0.00382	0.05460	0.01419	0.25986
6	0.00006	0.00862	0.00431	0.46886	0.00236	0.00472	2.13285	5.07983	0.00777	0.00214	0.00504	0.01554	2.43944	0.00382	2.45345	0.00637	0.01757	0.00423	0.24087
7	0.00004	0.00747	0.00373	0.70102	0.00313	0.00625	1.42650	1.78169	0.00507	0.00248	0.00389	0.00997	2.45855	0.00382	2.46619	0.00764	0.00993	0.00562	0.56597
8	0.00344	0.06620	0.03310	0.39313	0.02015	0.04031	2.54367	3.29072	0.06815	0.00981	0.03853	0.11661	2.47129	0.00382	2.57956	0.04331	0.12563	0.03488	0.27765
9	0.00833	0.10298	0.05149	0.29814	0.02753	0.05505	3.35409	3.17697	0.09579	0.02276	0.05618	0.17971	0.27006	0.02548	0.37324	0.17070	0.17340	0.06116	0.35273
10	0.00018	0.01508	0.00754	0.66834	0.00557	0.01115	1.49626	2.93504	0.01212	0.00469	0.00798	0.02336	0.94266	0.02293	0.95667	0.03949	0.02223	0.01022	0.45983
11	0.00794	0.10058	0.05029	0.28759	0.02638	0.05278	3.47712	3.91603	0.11421	0.02394	0.06093	0.19469	2.42543	0.03567	2.55536	0.17834	0.17682	0.05721	0.32355
12	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	0.91081	0.00369	0.91590	0.04331	0.00889	0.00697	0.78403
13	0.00062	0.02820	0.01410	0.65938	0.01086	0.02171	1.51657	2.61720	0.02185	0.00827	0.01467	0.04325	2.25218	0.04204	2.28403	0.06879	0.04077	0.01951	0.47856
14	0.00013	0.01278	0.00639	0.55318	0.00416	0.00832	1.80772	3.42800	0.01085	0.00201	0.00684	0.02070	1.26876	0.05987	1.28405	0.04841	0.02123	0.00769	0.36206
15	0.00007	0.00932	0.00466	0.89796	0.00379	0.00758	1.11363	2.10354	0.00580	0.00382	0.00477	0.01161	0.85476	0.05223	0.86240	0.05860	0.01062	0.00817	0.76890
16	0.01303	0.12881	0.06440	0.62427	0.05030	0.10059	1.60188	1.85853	0.09028	0.04748	0.06539	0.17356	0.99361	0.05860	1.09679	0.19617	0.15999	0.10370	0.64817
17	0.00831	0.10284	0.05142	0.45809	0.03421	0.06842	2.18298	2.33920	0.09110	0.03063	0.05559	0.15460	0.11974	0.09936	0.27133	0.12229	0.16275	0.06499	0.39930
18	0.01620	0.14364	0.07182	0.58747	0.05445	0.10891	1.70221	2.29402	0.11311	0.04561	0.07543	0.21521	0.55031	0.18216	0.74903	0.10318	0.20629	0.10002	0.48485
19	0.01031	0.11459	0.05729	0.37709	0.03459	0.06918	2.65192	2.11869	0.09625	0.01745	0.05947	0.16397	0.37834	0.20637	0.49681	0.09554	0.16586	0.07917	0.47732
20	0.00094	0.03459	0.01729	0.64650	0.01333	0.02666	1.54679	2.70880	0.02966	0.00998	0.01843	0.05457	1.45347	0.12739	1.49933	0.10063	0.05288	0.02262	0.42782
21	0.00037	0.02175	0.01088	0.47146	0.00687	0.01375	2.12109	3.09690	0.02009	0.00401	0.01201	0.03523	2.57447	0.12611	2.59485	0.09936	0.03570	0.01325	0.37117
22	0.00428	0.07381	0.03691	0.47785	0.02492	0.04985	2.09272	2.54125	0.06102	0.01720	0.03931	0.11496	1.16940	0.17452	1.27386	0.12993	0.11504	0.04736	0.41169
23	0.01455	0.13611	0.06806	0.21336	0.03085	0.06170	4.68691	3.21840	0.12007	0.00168	0.06958	0.23962	2.04072	0.29426	2.21269	0.12993	0.24970	0.07420	0.29715
24	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	2.55664	0.11974	2.56173	0.12484	0.00757	0.00683	0.90212
25	0.00318	0.06359	0.03179	0.36539	0.01864	0.03728	2.73680	2.61681	0.05637	0.01465	0.03397	0.09975	1.40379	0.13248	1.45857	0.21401	0.10633	0.03803	0.35762
26	0.00008	0.00985	0.00493	0.74864	0.00365	0.00731	1.33575	2.72620	0.00718	0.00305	0.00522	0.01394	0.00382	0.14140	0.00892	0.12993	0.01442	0.00673	0.46680
27	0.00860	0.10463	0.05232	0.48286	0.03577	0.07153	2.07098	2.08683	0.07832	0.02523	0.05337	0.14871	0.14140	0.15796	0.15796	0.30445	0.14642	0.07477	0.51069
28	0.00304	0.06217	0.03109	0.52789	0.02198	0.04397	1.89433	3.15467	0.05623	0.01590	0.03469	0.10748	2.58466	0.16051	2.60377	0.26496	0.10743	0.03598	0.33496
29	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	0.43821	0.18089	0.44458	0.18598	0.00889	0.00697	0.78403
30	0.01195	0.12333	0.06167	0.21848	0.02823	0.05647	4.57701	2.12880	0.09622	0.01454	0.05684	0.17626	0.87896	0.23821	1.05348	0.22547	0.18599	0.08178	0.43971
31	0.01151	0.12104	0.06052	0.39932	0.03766	0.07532	2.50424	2.16009	0.09230	0.02298	0.06169	0.17518	0.03694	0.21273	0.07006	0.38343	0.16936	0.08651	0.51080
32	0.00432	0.07416	0.03708	0.59717	0.02805	0.05611	1.67457	2.22180	0.05615	0.02507	0.03872	0.10822	1.49806	0.21656	1.55666	0.30573	0.10082	0.05455	0.54111
33	0.00102	0.03599	0.01800	0.51681	0.01236	0.02471	1.93494	3.07903	0.03034	0.01022	0.01987	0.06032	1.70952	0.27388	1.72353	0.21656	0.06167	0.02101	0.34061
34	0.00076	0.03103	0.01551	0.64149	0.01183	0.02366	1.55886	2.50299	0.02478	0.00845	0.01630	0.04674	2.35664	0.27133	2.38084	0.23312	0.04604	0.02091	0.45427
35	0.00546	0.08339	0.04170	0.37557	0.02498	0.04985	2.66261	2.66048	0.07461	0.01830	0.04477	0.13295	2.24964	0.29299	2.35154	0.37579	0.13046	0.05331	0.40860
36	0.00594	0.08694	0.04347	0.55713	0.03185	0.06369	1.79490	1.85575	0.06293	0.03105	0.04420	0.11624	2.53498	0.28025	2.60377	0.37197	0.10582	0.07142	0.67489
37	0.00905	0.10731	0.05366	0.56713	0.03982	0.07964	1.76325	2.48002	0.08914	0.02551	0.05725	0.16654	0.38598	0.28025	0.43439	0.43821	0.16573	0.06949	0.41930
38	0.01454	0.13606	0.06803	0.52269	0.04859	0.09718	1.91319	2.29363	0.11280	0.04191	0.07102	0.20357	1.02800	0.29681	1.09042	0.48916	0.19451	0.09518	0.48932
39	0.00405	0.07180	0.03590	0.63154	0.02794	0.05588	1.58344	1.87802	0.05006	0.01645	0.03629	0.09636	1.43437	0.29936	1.49042	0.37579	0.09514	0.05418	0.56947
40	0.02925	0.19299	0.09649	0.51891	0.06892	0.13784	1.92711	2.19499	0.15644	0.06519	0.10069	0.28349	0.64330	0.53884	0.79616	0.30190	0.24862	0.14980	0.60255
41	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	2.13117	0.30190	2.13626	0.30700	0.00757	0.00683	0.90212
42	0.00205	0.05104	0.02552	0.43379	0.01621	0.03242	2.30527	2.78184	0.04452	0.00585	0.02726	0.08211	0.91718	0.31974	0.98597	0.36178	0.08914	0.02923	0.32791
43	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	2.10059	0.31974	2.10569	0.32483	0.00757	0.00683	0.90212
44	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	2.16174	0.32611	2.16683	0.33120	0.00757	0.00683	0.90212
45	0.01264	0.12685	0.06342	0.28700	0.03339	0.06677	3.48432	2.70505	0.11975	0.00865	0.06548	0.20499	2.18085	0.51082	2.27893	0.33248	0.22414	0.07179	0.32029
46	0.00317	0.06349	0.03174	0.57336	0.02347	0.04693	1.74412	2.48298	0.05184	0.01737	0.03389	0.09767	1.27768	0.44712	1.29042	0.35159	0.09918	0.04064	0.40979
47	0.00012	0.01253	0.00627	0.61927	0.00434	0.00869	1.61480	3.36561	0.01026	0.00259	0.00690	0.02026	2.17957	0.35286	2.18849	0.36942	0.02119	0.00741	0.34985
48	0.00521	0.08141	0.04071	0.39063	0.02486	0.04971	2.55995	3.41804	0.07534	0.01305	0.04375	0.14705	1.75283	0.37324	1.77576	0.51719	0.14140	0.04688	0.33152
49	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	2.18722	0.37834	2.19231	0.38343	0.00757	0.00683	0.90212
50	0.00031	0.01992	0.00996	0.77181	0.00816	0.01632	1.29565	2.12369	0.01428	0.00699	0.01031	0.02707	1.21526	0.39107	1.23564	0.40636	0.02525	0.01571	0.62202
51	0.00153	0.04416	0.02208	0.7															



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-39 13.5m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸点X	絶対最大長軸点Y	絶対最大長軸点X	絶対最大長軸点Y	楕円長軸	楕円短軸	楕円長短比
52	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	2.08658	0.39490	2.09168	0.39999	0.00757	0.00683	0.90212
53	0.00011	0.01185	0.00593	0.85359	0.00486	0.00971	1.17152	2.12049	0.00771	0.00438	0.00610	0.01531	1.15284	0.41783	1.16049	0.40636	0.01471	0.00955	0.64950
54	0.00025	0.01766	0.00883	0.78464	0.00722	0.01443	1.27447	2.21871	0.01215	0.00590	0.00908	0.02427	2.02926	0.43056	2.04582	0.44585	0.02226	0.01401	0.62949
55	0.00391	0.07052	0.03526	0.52824	0.02504	0.05008	1.89309	2.84701	0.06252	0.02400	0.03809	0.11626	1.96556	0.55158	1.98467	0.43821	0.10885	0.04569	0.41975
56	0.00006	0.00862	0.00431	0.92163	0.00352	0.00704	1.08504	2.17495	0.00540	0.00390	0.00442	0.01081	1.24329	0.43948	1.24966	0.44585	0.00948	0.00784	0.82694
57	0.00219	0.05277	0.02639	0.49931	0.01806	0.03611	2.00277	2.74966	0.04453	0.01536	0.02853	0.08474	0.40254	0.45349	0.46496	0.50827	0.08035	0.03466	0.43142
58	0.00067	0.02921	0.01461	0.49514	0.00969	0.01939	2.01963	2.85393	0.02622	0.00557	0.01559	0.04655	1.80124	0.45732	1.81780	0.49935	0.04759	0.01793	0.37672
59	0.00007	0.00920	0.00460	0.92484	0.00382	0.00763	1.08127	2.13803	0.00581	0.00375	0.00472	0.01161	1.13883	0.46678	1.14647	0.46241	0.01034	0.00819	0.79161
60	0.00439	0.07479	0.03739	0.70998	0.03092	0.06184	1.40849	1.65073	0.05001	0.02735	0.03782	0.09429	1.28150	0.55031	1.32099	0.46623	0.09013	0.06205	0.68848
61	0.00476	0.07789	0.03894	0.72302	0.03252	0.06504	1.38310	1.35931	0.04596	0.02826	0.03925	0.08918	2.08021	0.55540	2.16301	0.52610	0.08836	0.06865	0.77696
62	0.00520	0.08139	0.04069	0.28572	0.02116	0.04232	3.49989	3.32625	0.07603	0.01786	0.04795	0.14441	0.30190	0.55922	0.44458	0.57069	0.13297	0.04981	0.37461
63	0.00036	0.02127	0.01064	0.22254	0.00445	0.00891	4.49359	4.80883	0.02147	0.00221	0.01138	0.04140	0.44840	0.55922	0.47770	0.53247	0.04657	0.00972	0.20867
64	0.00202	0.05076	0.02538	0.79098	0.02198	0.04395	1.26426	1.46576	0.03234	0.01919	0.02567	0.05983	2.46237	0.56177	2.51205	0.59234	0.06060	0.04251	0.70148
65	0.00006	0.00862	0.00431	0.92163	0.00352	0.00704	1.08504	2.17495	0.00540	0.00390	0.00442	0.01081	1.84964	0.56177	1.85601	0.56814	0.00948	0.00784	0.82694
66	0.00665	0.09203	0.04601	0.35976	0.02701	0.05402	2.77962	2.98941	0.08163	0.01092	0.04957	0.15572	0.61910	0.64839	0.75158	0.56942	0.17010	0.04979	0.29272
67	0.01231	0.12520	0.06260	0.28570	0.03287	0.06574	3.50016	1.73467	0.08568	0.00279	0.05752	0.16200	1.70952	0.64751	1.74519	0.59234	0.19369	0.08093	0.41786
68	0.00018	0.01521	0.00761	0.71721	0.00585	0.01171	1.39429	1.91038	0.00969	0.00461	0.00775	0.01911	0.45986	0.58980	0.46623	0.60636	0.02002	0.01156	0.57761
69	0.00111	0.03757	0.01878	0.57353	0.01365	0.02729	1.74358	2.39605	0.03174	0.00644	0.02002	0.05578	2.02161	0.59871	2.07257	0.61782	0.06116	0.02307	0.37729
70	0.00046	0.02410	0.01205	0.70408	0.00953	0.01905	1.42029	2.45929	0.01967	0.00790	0.01282	0.03561	0.31719	0.61527	0.34776	0.59999	0.03596	0.01615	0.44901
71	0.00006	0.00909	0.00455	0.95328	0.00384	0.00769	1.04901	1.71366	0.00580	0.00382	0.00467	0.01161	0.39107	0.61910	0.39744	0.61145	0.01007	0.00821	0.81492
72	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.40254	0.61527	0.40763	0.62037	0.00757	0.00683	0.90212
73	0.00260	0.05751	0.02876	0.70050	0.02347	0.04695	1.42756	1.52973	0.03853	0.02299	0.02922	0.06938	0.00382	0.61910	0.04204	0.67515	0.06789	0.04872	0.71770
74	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.38980	0.62801	0.39490	0.63311	0.00757	0.00683	0.90212
75	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.40381	0.62801	0.40891	0.63311	0.00757	0.00683	0.90212
76	0.00019	0.01548	0.00774	0.45390	0.00462	0.00924	2.20315	3.96716	0.01405	0.00198	0.00854	0.02731	0.40509	0.64330	0.42674	0.62929	0.02827	0.00848	0.29980
77	0.00009	0.01095	0.00547	0.82314	0.00435	0.00870	1.21487	2.30967	0.00738	0.00375	0.00568	0.01457	0.48407	0.63438	0.49044	0.64585	0.01453	0.00825	0.56780
78	0.00025	0.01790	0.00895	0.47993	0.00561	0.01122	2.08363	2.63200	0.01360	0.00153	0.00897	0.02628	0.37451	0.64585	0.38853	0.66623	0.02875	0.01114	0.38758
79	0.00006	0.00850	0.00425	0.88618	0.00338	0.00677	1.12844	2.22355	0.00536	0.00318	0.00439	0.01072	0.39490	0.64839	0.40254	0.65349	0.01034	0.00700	0.67689
80	0.00338	0.06565	0.03282	0.43271	0.02101	0.04202	2.31100	1.91029	0.04836	0.01173	0.03268	0.08828	0.05605	0.71463	0.11465	0.65094	0.08654	0.04980	0.57549
81	0.00025	0.01801	0.00901	0.44124	0.00539	0.01078	2.26634	2.47564	0.01372	0.00192	0.00918	0.02554	0.47005	0.65222	0.49044	0.66495	0.02838	0.01143	0.40277
82	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.36305	0.65986	0.36815	0.66495	0.00757	0.00683	0.90212
83	0.00789	0.10022	0.05011	0.29992	0.02685	0.05371	3.33427	2.48061	0.08008	0.03158	0.05187	0.15446	0.37579	0.80635	0.42037	0.65986	0.14737	0.06815	0.46242
84	0.00634	0.08981	0.04491	0.70803	0.03720	0.07441	1.41236	1.57421	0.05789	0.03531	0.04530	0.11095	1.34137	0.69043	1.44201	0.73374	0.10869	0.07421	0.68275
85	0.00212	0.05195	0.02597	0.46030	0.01705	0.03410	2.17247	2.35547	0.04492	0.00401	0.02517	0.07713	0.60890	0.67005	0.67260	0.71081	0.08313	0.03246	0.39042
86	0.00026	0.01824	0.00912	0.40294	0.00520	0.01040	2.48177	2.90410	0.01535	0.00337	0.00995	0.02793	0.47133	0.67642	0.47897	0.70190	0.03210	0.01036	0.32278
87	0.00023	0.01713	0.00856	0.67815	0.00646	0.01291	1.47459	2.09869	0.01184	0.00525	0.00886	0.02272	0.34012	0.70572	0.35795	0.69425	0.02285	0.01284	0.56208
88	0.00009	0.01085	0.00543	0.35203	0.00265	0.00529	2.84070	6.63246	0.01190	0.00238	0.00690	0.02297	2.60249	0.68916	2.60377	0.71081	0.02263	0.00520	0.22997
89	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.44712	0.69171	0.45222	0.69680	0.00757	0.00683	0.90212
90	0.01198	0.12351	0.06175	0.39258	0.03811	0.07622	2.54727	2.56423	0.10615	0.03279	0.06499	0.19480	1.57194	0.69298	1.60251	0.88406	0.20537	0.07428	0.36168
91	0.00097	0.03506	0.01753	0.34152	0.00965	0.01929	2.92812	6.13697	0.04171	0.00626	0.02334	0.08178	0.00382	0.79234	0.01019	0.71209	0.08773	0.01401	0.15972
92	0.01834	0.15281	0.07641	0.56910	0.05705	0.11410	1.75717	1.94218	0.11431	0.04172	0.07858	0.21078	1.80378	0.72483	1.95410	0.87005	0.20213	0.11553	0.57154
93	0.00949	0.10990	0.05495	0.55291	0.04027	0.08053	1.80862	1.95043	0.07913	0.03164	0.05564	0.15126	0.67260	0.72355	0.80763	0.78852	0.14381	0.08399	0.58405
94	0.00444	0.07521	0.03761	0.60642	0.02869	0.05737	1.64901	1.53762	0.04997	0.02639	0.03790	0.09135	0.24585	0.78852	0.31592	0.73247	0.09031	0.06264	0.69361
95	0.00018	0.01535	0.00767	0.59675	0.00533	0.01065	1.67575	2.62137	0.01187	0.00421	0.00815	0.02232	0.44330	0.72992	0.44840	0.75030	0.02328	0.01012	0.43469
96	0.00024	0.01749	0.00874	0.61500	0.00629	0.01258	1.62601	3.06236	0.01476	0.00307	0.00946	0.02807	0.47897	0.75285	0.49426	0.73120	0.02860	0.01069	0.37383
97	0.00531	0.08221	0.04110	0.57296	0.03052	0.06105	1.74531	1.86598	0.05769	0.02643	0.04227	0.11017	2.49931	0.80508	2.60377	0.83565	0.10993	0.06148	0.55927
98	0.00499	0.07969	0.03985	0.44458	0.02598	0.05196	2.24932	2.60629	0.06701	0.01753	0.04068	0.12581	0.02675	0.80763	0.08790	0.91590	0.12261	0.05180	0.42247
99	0.02590	0.18160	0.09080	0.25630	0.04538	0.09076	3.90165	2.48669	0.14790	0.00591	0.08404	0.28271	1.64833	1.03310	1.82799	0.81909	0.29711	0.11099	0.37358
100	0.00841	0.10350	0.05175	0.42168	0.03301	0.06602	2.37148	1.67418	0.06975	0.02855	0.05197	0.13154	0.37706	0.92992	0.48024	0.85094	0.13259	0.08080	0.60940
101	0.00218	0.05274	0.02637	0.60595	0.01994	0.03987	1.65030	2.61053	0.04255	0.01392	0.02881	0.08276	0.92610	0.86877	1.00253	0.84075	0.08746	0.03180	0.36358
102	0.00593	0.08688	0																



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-39 13.5m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸X	絶対最大長軸Y	絶対最大長傾角X	絶対最大長傾角Y	楕円長軸	楕円短軸	楕円長短比
103	0.00011	0.01203	0.00601	0.68201	0.00436	0.00872	1.46625	2.88619	0.00916	0.00346	0.00630	0.01794	1.33628	0.88278	1.34902	0.87259	0.01753	0.00825	0.47041
104	0.06249	0.28207	0.14104	0.18561	0.06017	0.12035	5.38754	3.28113	0.26580	0.06725	0.16506	0.50598	0.19617	0.89170	0.32993	1.37832	0.49346	0.16124	0.32675
105	0.01388	0.13292	0.06646	0.24574	0.03236	0.06472	4.06927	1.97546	0.09408	0.00128	0.06218	0.18349	2.31460	0.96686	2.49422	0.99743	0.21065	0.08387	0.39813
106	0.00459	0.07648	0.03824	0.67877	0.03091	0.06182	1.47326	1.78899	0.05377	0.02063	0.03881	0.10037	0.27388	0.91208	0.28789	1.01017	0.10227	0.05719	0.55920
107	0.00470	0.07733	0.03866	0.60614	0.02951	0.05902	1.64979	1.49900	0.05031	0.02867	0.03901	0.09281	1.87257	0.93374	1.93372	1.00125	0.08954	0.06678	0.74584
108	0.00359	0.06757	0.03379	0.66927	0.02704	0.05409	1.49417	2.09749	0.05036	0.01835	0.03529	0.09575	1.18214	1.02800	1.19870	0.93501	0.09930	0.04598	0.46308
109	0.00624	0.08911	0.04455	0.67961	0.03615	0.07230	1.47144	1.55097	0.06105	0.03461	0.04499	0.10923	0.82546	0.94138	0.84712	1.04711	0.10707	0.07415	0.69255
110	0.03336	0.20610	0.10305	0.39410	0.06410	0.12821	2.53741	1.69506	0.14454	0.05777	0.10418	0.26589	1.34520	1.17705	1.48532	0.95285	0.26653	0.15938	0.59796
111	0.01135	0.12022	0.06011	0.22955	0.02821	0.05643	4.35636	2.61021	0.10790	0.00793	0.06468	0.19027	0.49298	0.98215	0.67260	1.04074	0.21696	0.06661	0.30703
112	0.00051	0.02551	0.01276	0.72998	0.01031	0.02062	1.36990	1.99117	0.01713	0.00844	0.01316	0.03406	0.77451	0.97960	0.78215	1.01144	0.03399	0.01915	0.56342
113	0.00717	0.09552	0.04776	0.46251	0.03189	0.06378	2.16211	2.26352	0.07252	0.02190	0.05079	0.14109	0.31464	0.99106	0.43056	1.06877	0.15499	0.05887	0.37979
114	0.00578	0.08580	0.04290	0.28507	0.02231	0.04462	3.50791	2.80255	0.07874	0.01580	0.04731	0.13992	2.51078	1.10698	2.57574	0.98469	0.14994	0.04910	0.32744
115	0.00031	0.01981	0.00991	0.66717	0.00751	0.01501	1.49887	2.78316	0.01595	0.00559	0.01066	0.03066	2.24454	1.00890	2.26237	1.03183	0.02979	0.01318	0.44229
116	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.98597	1.02291	0.99106	1.02800	0.00757	0.00683	0.90212
117	0.00298	0.06159	0.03080	0.40553	0.01903	0.03805	2.46594	1.84197	0.04175	0.01319	0.03046	0.08109	2.47256	1.10571	2.48403	1.02673	0.08435	0.04497	0.53319
118	0.00426	0.07367	0.03684	0.55858	0.02694	0.05388	1.79024	1.88118	0.05534	0.02130	0.03755	0.09887	1.71207	1.04839	1.74519	1.14010	0.10123	0.05362	0.52966
119	0.03200	0.20186	0.10093	0.26955	0.05181	0.10362	3.70984	2.76451	0.18654	0.03764	0.10574	0.33184	2.11078	1.06240	2.17193	1.38723	0.35644	0.11431	0.32071
120	0.00013	0.01278	0.00639	0.57515	0.00424	0.00848	1.73868	3.55966	0.01065	0.00322	0.00711	0.02109	2.59867	1.11972	2.60377	1.10061	0.02328	0.00701	0.30110
121	0.00928	0.10870	0.05435	0.60579	0.04172	0.08344	1.65072	1.63615	0.07495	0.03299	0.05500	0.13713	1.55411	1.23310	1.59360	1.10316	0.13709	0.08619	0.62869
122	0.01222	0.12476	0.06238	0.39971	0.03884	0.07768	2.50182	2.07369	0.08880	0.02377	0.06105	0.17694	0.91336	1.27513	0.98724	1.11590	0.18059	0.08618	0.47723
123	0.00510	0.08060	0.04030	0.44334	0.02624	0.05248	2.25561	2.04538	0.05953	0.01266	0.04113	0.11273	1.72226	1.19615	1.83181	1.17577	0.12161	0.05342	0.43924
124	0.00006	0.00850	0.00425	0.88618	0.00338	0.00677	1.12844	2.22355	0.00536	0.00318	0.00439	0.01072	0.78979	1.15412	0.79744	1.15921	0.01034	0.00700	0.67689
125	0.01962	0.15805	0.07902	0.35481	0.04648	0.09295	2.81845	1.57552	0.11050	0.02118	0.07572	0.19587	2.20378	1.32609	2.31333	1.16558	0.20420	0.12233	0.59907
126	0.00022	0.01658	0.00829	0.57414	0.00569	0.01137	1.74173	2.60298	0.01276	0.00355	0.00862	0.02421	0.74648	1.17832	0.76686	1.16813	0.02471	0.01112	0.45016
127	0.00620	0.08884	0.04442	0.56046	0.03267	0.06533	1.78426	1.84311	0.06419	0.03365	0.04594	0.11848	0.44967	1.28915	0.49426	1.18087	0.10998	0.07177	0.65255
128	0.00007	0.00964	0.00482	0.79574	0.00368	0.00737	1.25669	2.40974	0.00641	0.00318	0.00503	0.01282	0.82801	1.18851	0.83310	1.19870	0.01326	0.00701	0.52868
129	0.02017	0.16026	0.08013	0.41449	0.05100	0.10199	2.41261	3.17061	0.15609	0.03495	0.08687	0.28208	1.10953	1.19361	1.24711	1.43819	0.26907	0.09545	0.35474
130	0.00010	0.01113	0.00557	0.93249	0.00478	0.00957	1.07240	2.11644	0.00718	0.00500	0.00571	0.01441	0.80126	1.20634	0.81017	1.19743	0.01232	0.01006	0.81631
131	0.00047	0.02435	0.01218	0.39430	0.00707	0.01414	2.53612	1.54283	0.02714	0.00467	0.01530	0.05107	0.80763	1.25348	0.83183	1.21017	0.05265	0.01126	0.21389
132	0.00791	0.10035	0.05018	0.50229	0.03497	0.06994	1.99086	2.17657	0.07464	0.02801	0.05124	0.14558	0.13503	1.30698	0.27898	1.29679	0.14546	0.06923	0.47594
133	0.00020	0.01613	0.00807	0.46043	0.00489	0.00978	2.17187	4.20268	0.01538	0.00301	0.00939	0.02954	1.95665	1.24583	1.96556	1.27259	0.03178	0.00819	0.25776
134	0.00727	0.09621	0.04810	0.44622	0.03154	0.06309	2.24106	2.79022	0.08825	0.02787	0.05176	0.15776	0.56432	1.27641	0.71463	1.31972	0.15549	0.05953	0.38284
135	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	1.99996	1.25093	2.00505	1.25603	0.00757	0.00683	0.90212
136	0.00773	0.09918	0.04959	0.31440	0.02722	0.05444	3.18065	2.97491	0.08703	0.01033	0.05025	0.16745	0.48789	1.41016	0.54649	1.25475	0.17422	0.05646	0.32408
137	0.00829	0.10276	0.05138	0.22086	0.02355	0.04711	4.52779	2.90968	0.08944	0.01979	0.05301	0.17099	0.04331	1.25857	0.06624	1.42672	0.16581	0.06369	0.38410
138	0.00232	0.05437	0.02719	0.47386	0.01814	0.03627	2.11031	2.86640	0.04876	0.00951	0.02988	0.08922	1.37195	1.29679	1.45220	1.26112	0.09548	0.03097	0.32432
139	0.00094	0.03459	0.01729	0.60455	0.01285	0.02571	1.65411	2.24411	0.02580	0.00787	0.01818	0.04953	1.80378	1.26622	1.81398	1.31335	0.05154	0.02321	0.45038
140	0.00029	0.01907	0.00953	0.39719	0.00543	0.01085	2.51771	3.61913	0.01669	0.00466	0.01042	0.03276	2.00760	1.26622	2.02161	1.29424	0.03403	0.01069	0.31398
141	0.00055	0.02650	0.01325	0.75859	0.01094	0.02188	1.31823	1.91072	0.01790	0.00952	0.01350	0.03473	0.30318	1.29551	0.33120	1.27768	0.03231	0.02174	0.67297
142	0.00007	0.00975	0.00487	0.89816	0.00403	0.00806	1.11338	2.49129	0.00671	0.00398	0.00511	0.01342	1.95410	1.28915	1.96174	1.28023	0.01213	0.00783	0.64573
143	0.00017	0.01459	0.00729	0.78498	0.00585	0.01171	1.27391	1.84350	0.00971	0.00557	0.00752	0.01794	0.11847	1.28278	0.12484	1.29806	0.01823	0.01167	0.64041
144	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	1.99359	1.29042	1.99869	1.29679	0.00889	0.00697	0.78403
145	0.02303	0.17126	0.08563	0.53108	0.06180	0.12361	1.88297	1.57548	0.10990	0.05703	0.08596	0.21290	0.92610	1.30061	0.98724	1.50315	0.21431	0.13685	0.63857
146	0.00444	0.07517	0.03759	0.47300	0.02524	0.05048	2.11414	1.74349	0.05412	0.02176	0.03841	0.09692	2.52861	1.32736	2.60377	1.38596	0.09967	0.05669	0.56879
147	0.00362	0.06789	0.03395	0.66456	0.02707	0.05415	1.50476	1.90248	0.04708	0.02121	0.03508	0.09162	1.29806	1.37577	1.38468	1.40125	0.09346	0.04932	0.52774
148	0.00556	0.08413	0.04207	0.42474	0.02682	0.05364	2.35439	2.88289	0.07602	0.01764	0.04504	0.13975	1.60251	1.36303	1.63309	1.49806	0.14874	0.04759	0.31994
149	0.00128	0.04030	0.02015	0.34981	0.01133	0.02265	2.85870	2.92457	0.03436	0.00194	0.02117	0.06550	0.18471	1.42163	0.21783	1.36685	0.07673	0.02116	0.27583
150	0.00634	0.08985	0.04492	0.40596	0.02804	0.05608	2.46331	2.81111	0.07727	0.02429	0.04859	0.14758	2.24199	1.36812	2.32734	1.48659	0.14123	0.05716	0.40468
151	0.00410	0.07227	0.03614	0.44704	0.02358	0.04715	2.23695	2.07943	0.05880	0.02066	0.03768	0.10169	0.41400	1.41398	0.50445	1.45729	0.10260	0.05091	0.49621
152	0.00107	0.03684	0.01842	0.64478	0.01420	0.02840	1.55092	2.68145	0.03000	0.00960	0.01948	0.05792	0.85603	1.40507	0.90062	1.43946	0.05383	0.02522	0.4684



Appendix 2-18 Roundness of the Opaque Minerals

MJBKE-39 13.5m

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長軸点X	絶対最大長軸点Y	絶対最大長軸点Z	絶対最大長軸点W	楕円長軸	楕円短軸	楕円長短比
154	0.00394	0.07081	0.03541	0.46970	0.02368	0.04735	2.12900	1.89856	0.05037	0.01448	0.03548	0.09520	1.99869	1.41781	2.02798	1.50698	0.10496	0.04777	0.45513
155	0.00602	0.08758	0.04379	0.31863	0.02412	0.04824	3.13846	2.67792	0.08667	0.00246	0.04545	0.13986	2.42543	1.49551	2.54899	1.43309	0.13960	0.05494	0.39355
156	0.02127	0.16457	0.08228	0.29321	0.04397	0.08794	3.41056	2.14177	0.12692	0.03609	0.08333	0.23766	1.63054	1.57449	1.85983	1.51717	0.24440	0.11081	0.45341
157	0.02242	0.16896	0.08448	0.24827	0.04150	0.08299	4.02787	1.80637	0.12687	0.01020	0.08296	0.22386	1.25603	1.50825	1.45984	1.59742	0.23845	0.11972	0.50207
158	0.00017	0.01487	0.00743	0.76699	0.00592	0.01184	1.30380	2.57310	0.01118	0.00534	0.00791	0.02169	2.34135	1.47003	2.35282	1.48659	0.02053	0.01077	0.52434
159	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	1.33755	1.49169	1.34392	1.49678	0.00889	0.00697	0.78403
160	0.00460	0.07655	0.03827	0.22429	0.01754	0.03507	4.45855	3.03033	0.06621	0.00364	0.04134	0.12892	2.25346	1.51971	2.37702	1.55156	0.14971	0.03914	0.26142
161	0.00032	0.02028	0.01014	0.58609	0.00717	0.01435	1.70623	2.90761	0.01693	0.00365	0.01095	0.03196	1.88149	1.50443	1.91079	1.49551	0.03446	0.01193	0.34616
162	0.00010	0.01141	0.00570	0.89539	0.00478	0.00957	1.11684	2.03093	0.00719	0.00507	0.00582	0.01441	1.34010	1.51080	1.34902	1.50188	0.01274	0.01022	0.80208
163	0.00664	0.09193	0.04596	0.19720	0.01982	0.03964	5.07099	2.47581	0.07893	0.00559	0.04406	0.14047	0.50445	1.51334	0.55413	1.64328	0.15546	0.05436	0.34967
164	0.00960	0.11057	0.05528	0.36291	0.03272	0.06544	2.75552	3.64786	0.10847	0.01519	0.06060	0.20746	0.92482	1.65092	1.07896	1.51462	0.21269	0.05748	0.27025
165	0.00755	0.09804	0.04902	0.43082	0.03157	0.06314	2.32116	2.98926	0.08815	0.02243	0.05474	0.16632	0.18089	1.67767	0.20637	1.51462	0.17188	0.05592	0.32533
166	0.00059	0.02739	0.01369	0.54523	0.00954	0.01908	1.83408	2.89006	0.02308	0.00828	0.01474	0.04392	2.30186	1.58723	2.32479	1.55156	0.04330	0.01732	0.39996
167	0.01591	0.14232	0.07116	0.54743	0.05206	0.10413	1.82671	1.67549	0.09494	0.04750	0.07229	0.18217	1.03437	1.70952	1.12864	1.55538	0.17537	0.11550	0.65861
168	0.00007	0.00920	0.00460	0.92484	0.00382	0.00763	1.08127	2.13803	0.00581	0.00375	0.00472	0.01161	2.32861	1.56303	2.33626	1.56939	0.01034	0.00819	0.79161
169	0.00195	0.04977	0.02489	0.69249	0.02013	0.04025	1.44406	1.94523	0.03618	0.01543	0.02552	0.06747	1.88149	1.62799	1.89932	1.56430	0.06788	0.03650	0.53769
170	0.00041	0.02282	0.01141	0.61944	0.00838	0.01676	1.61436	2.45060	0.01733	0.00603	0.01194	0.03334	0.48916	1.56557	0.51846	1.57831	0.03253	0.01601	0.49214
171	0.00011	0.01168	0.00584	0.90447	0.00495	0.00990	1.10562	2.13951	0.00767	0.00491	0.00599	0.01523	0.49935	1.59487	0.50827	1.60506	0.01341	0.01017	0.75818
172	0.00298	0.06162	0.03081	0.49689	0.02113	0.04226	2.01254	2.17143	0.05024	0.00600	0.03103	0.08835	0.75412	1.66239	0.83693	1.63564	0.09527	0.03986	0.41837
173	0.00006	0.00909	0.00455	0.84003	0.00355	0.00709	1.19043	2.29927	0.00587	0.00328	0.00470	0.01174	0.65476	1.63309	0.66368	1.63818	0.01180	0.00701	0.59392
174	0.00038	0.02194	0.01097	0.82312	0.00936	0.01872	1.21489	2.19701	0.01545	0.00902	0.01133	0.03058	1.83181	1.66748	1.85092	1.64583	0.02707	0.01778	0.65702
175	0.00103	0.03625	0.01812	0.71494	0.01473	0.02946	1.39871	1.69725	0.02321	0.01110	0.01844	0.04539	1.89932	1.65220	1.92098	1.69041	0.04651	0.02825	0.60735
176	0.01194	0.12331	0.06165	0.25020	0.03025	0.06049	3.99674	2.24120	0.09336	0.00676	0.05684	0.18105	1.12100	1.81015	1.24583	1.68149	0.20247	0.07509	0.37089
177	0.00193	0.04963	0.02481	0.75511	0.02097	0.04194	1.32431	2.00501	0.03543	0.01696	0.02577	0.06834	2.39103	1.70570	2.44581	1.66748	0.06712	0.03669	0.54669
178	0.00741	0.09712	0.04856	0.47746	0.03296	0.06592	2.09442	2.43065	0.07836	0.03262	0.05077	0.14873	1.29169	1.75410	1.41908	1.68022	0.13276	0.07104	0.53510
179	0.00289	0.06069	0.03035	0.62586	0.02343	0.04685	1.59780	2.07727	0.04465	0.01210	0.03127	0.08535	1.48532	1.76047	1.56303	1.72863	0.09116	0.04041	0.44327
180	0.00255	0.05699	0.02850	0.76862	0.02438	0.04877	1.30103	1.50384	0.03432	0.02107	0.02879	0.06821	2.36683	1.78213	2.38721	1.71844	0.06786	0.04787	0.70540
181	0.00663	0.09187	0.04593	0.65160	0.03649	0.07299	1.53469	1.63796	0.05946	0.03452	0.04679	0.11572	0.80253	1.72735	0.82546	1.83945	0.11175	0.07553	0.67590
182	0.00370	0.06866	0.03433	0.38436	0.02070	0.04139	2.60170	3.56337	0.06865	0.00779	0.03769	0.12603	0.95794	1.84455	1.00380	1.72863	0.12657	0.03725	0.29433
183	0.00766	0.09874	0.04937	0.53126	0.03540	0.07079	1.86232	1.67267	0.06415	0.02674	0.04990	0.12561	1.18342	1.86238	1.26239	1.76684	0.12572	0.07756	0.61692
184	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.55668	1.77958	0.56177	1.78468	0.00757	0.00683	0.90212
185	0.00756	0.09808	0.04904	0.54103	0.03549	0.07097	1.84834	2.14493	0.08006	0.02871	0.05151	0.14131	0.80325	1.84327	1.44328	1.80633	0.13646	0.07049	0.51659
186	0.02331	0.17228	0.08614	0.17249	0.03518	0.07037	5.79729	3.38170	0.16735	0.00476	0.08915	0.31156	2.32097	1.94900	2.60377	1.82162	0.33555	0.08846	0.26362
187	0.00160	0.04509	0.02254	0.59906	0.01685	0.03371	1.66928	1.49571	0.02899	0.01399	0.02269	0.05326	2.17320	1.87003	2.18339	1.81907	0.05565	0.03653	0.65646
188	0.00817	0.10196	0.05098	0.31250	0.02791	0.05582	3.19996	2.77103	0.08787	0.00300	0.05208	0.16623	1.42290	1.92098	1.55793	1.82671	0.19017	0.05467	0.28748
189	0.00367	0.06838	0.03419	0.39711	0.02095	0.04190	2.51822	2.95522	0.07092	0.01957	0.03909	0.11431	2.28785	1.86748	2.39103	1.82162	0.10763	0.04344	0.40364
190	0.00009	0.01085	0.00543	0.92578	0.00464	0.00928	1.08017	2.20893	0.00717	0.00446	0.00561	0.01433	2.41778	1.83563	2.42798	1.82799	0.01282	0.00919	0.71689
191	0.01132	0.12007	0.06004	0.55505	0.04414	0.08828	1.80165	2.03055	0.09118	0.03248	0.06196	0.16885	0.78852	1.88404	0.95539	1.89932	0.16196	0.08902	0.54963
192	0.00116	0.03846	0.01923	0.59222	0.01421	0.02842	1.88856	2.10325	0.02823	0.00868	0.01928	0.05355	0.74266	1.88913	0.77323	1.84710	0.05537	0.02672	0.48251
193	0.01352	0.13121	0.06560	0.52345	0.04686	0.09372	1.91039	2.03714	0.09763	0.03907	0.06867	0.18489	0.39490	1.86366	0.55795	1.94773	0.18426	0.09343	0.50703
194	0.00368	0.06842	0.03421	0.60345	0.02597	0.05195	1.65713	2.01719	0.05446	0.02452	0.03623	0.09498	1.25985	1.94009	1.35284	1.95155	0.09165	0.05108	0.55734
195	0.00225	0.05353	0.02677	0.37777	0.01587	0.03173	2.64710	1.98914	0.03898	0.00668	0.02631	0.07281	0.72228	1.90060	0.78852	1.92735	0.06777	0.03733	0.48622
196	0.00147	0.04329	0.02164	0.40432	0.01319	0.02637	2.47329	3.91781	0.04424	0.00836	0.02500	0.08209	1.19361	1.89550	1.25475	1.94773	0.08248	0.02272	0.27545
197	0.00294	0.06119	0.03059	0.44451	0.01980	0.03961	2.24968	3.56284	0.06162	0.01685	0.03461	0.11213	1.67003	1.94900	1.78086	1.95155	0.10182	0.03677	0.36115
198	0.00139	0.04210	0.02105	0.46710	0.01379	0.02759	2.14088	1.87988	0.03269	0.00963	0.02156	0.05534	1.88276	1.90824	1.91461	1.95155	0.05884	0.03013	0.51205
199	0.00049	0.02494	0.01247	0.39063	0.00722	0.01443	2.55997	3.39612	0.02274	0.00152	0.01324	0.04255	2.13626	1.93117	2.17193	1.91079	0.04431	0.01404	0.31678
200	0.00004	0.00719	0.00359	0.78540	0.00318	0.00637	1.27324	1.57080	0.00450	0.00318	0.00370	0.00901	0.55668	1.77958	0.56177	1.78468	0.00757	0.00683	0.90212
201	0.00006	0.00862	0.00431	0.92163	0.00352	0.00704	1.08504	2.17495	0.00540	0.00390	0.00442	0.01081	2.32225	1.91206	2.32861	1.91843	0.00948	0.00784	0.82694
202	0.00012	0.01261	0.00631	0.76797	0.00492	0.00984	1.30213	2.40567	0.00876	0.00359	0.00658	0.01741	2.18467	1.92098	2.19868	1.91334	0.01768	0.00900	0.50885
203	0.00005	0.00787	0.00394	0.93184	0.00318	0.00636	1.07314	2.20809	0.00489	0.00328	0.00404	0.00979	2.50313	1.91461	2.50823	1.92098	0.00889	0.00697	0.78403
2																			



Appendix 2-18 Roundness of the Opaque Minerals

Kaaoitel Pit Conc.

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾角X	絶対最大長傾角Y	絶対最大長傾角Z	絶対最大長傾角X	絶対最大長傾角Y	楕円長軸	楕円短軸	楕円長短比
1	0.00193	0.04954	0.02477	0.74795	0.02081	0.04161	1.33699	1.87653	0.03352	0.01483	0.02511	0.06591	0.06751	0.05223	0.10828	0.00255	0.06369	0.03854	0.60512	
2	0.01398	0.13341	0.06671	0.34915	0.03880	0.07761	2.86407	1.99013	0.10042	0.03956	0.06718	0.18528	0.38980	0.13630	0.54521	0.03822	0.18942	0.09397	0.49610	
3	0.00339	0.06568	0.03284	0.70936	0.02703	0.05407	1.40973	1.82414	0.04629	0.02196	0.03374	0.08670	0.84712	0.00382	0.91973	0.04841	0.08752	0.04929	0.56318	
4	0.00424	0.07348	0.03674	0.47183	0.02462	0.04923	2.11940	2.67288	0.06159	0.00106	0.03751	0.11718	1.01272	0.00382	1.12482	0.03312	0.12809	0.04215	0.32903	
5	0.00310	0.06279	0.03139	0.52282	0.02208	0.04416	1.91269	2.22109	0.04695	0.00978	0.03102	0.09101	1.19361	0.07516	1.24583	0.00255	0.09228	0.04272	0.46292	
6	0.00987	0.11212	0.05606	0.65636	0.04480	0.08959	1.52355	1.70777	0.07834	0.03135	0.05654	0.14452	1.47513	0.08790	1.58978	0.00255	0.14916	0.08427	0.56501	
7	0.00029	0.01928	0.00964	0.85489	0.00830	0.01660	1.16974	1.69330	0.01207	0.00830	0.00978	0.02336	1.97958	0.00382	1.99614	0.01783	0.02209	0.01684	0.76212	
8	0.00041	0.02277	0.01139	0.85689	0.00992	0.01985	1.16701	1.80730	0.01441	0.01010	0.01155	0.02882	2.00633	0.02166	2.02544	0.00255	0.02594	0.02000	0.77093	
9	0.00329	0.06471	0.03236	0.64705	0.02541	0.05081	1.54548	2.04311	0.05003	0.02001	0.03386	0.09030	2.14008	0.00382	2.22798	0.01783	0.09368	0.04470	0.47717	
10	0.00114	0.03817	0.01908	0.72152	0.01559	0.03119	1.38596	2.07909	0.02848	0.01148	0.02005	0.05294	2.47893	0.00382	2.52861	0.01783	0.05604	0.02599	0.46376	
11	0.00894	0.10670	0.05335	0.45400	0.03533	0.07066	2.20262	3.60776	0.10781	0.02079	0.06054	0.19918	1.25093	0.11083	1.43054	0.02802	0.20346	0.05595	0.27501	
12	0.00029	0.01912	0.00956	0.86869	0.00830	0.01660	1.15116	1.85736	0.01215	0.00819	0.00971	0.02427	0.37961	0.02675	0.39490	0.01019	0.02176	0.01680	0.77200	
13	0.00055	0.02650	0.01325	0.81303	0.01133	0.02265	1.22997	1.77148	0.01677	0.00968	0.01339	0.03344	2.57956	0.03439	2.60504	0.01529	0.03173	0.02214	0.69792	
14	0.00104	0.03634	0.01817	0.80690	0.01571	0.03142	1.23931	1.80454	0.02402	0.01259	0.01842	0.04698	0.77833	0.05987	0.80635	0.02420	0.04472	0.02952	0.66004	
15	0.00321	0.06390	0.03195	0.29567	0.01676	0.03351	3.38219	3.76899	0.06281	0.00829	0.03731	0.11965	1.85983	0.04204	1.96939	0.08662	0.13969	0.02923	0.20922	
16	0.02113	0.16401	0.08200	0.59927	0.06287	0.12573	1.66870	2.06317	0.11957	0.05599	0.08433	0.23329	2.36556	0.04968	2.52861	0.21401	0.21980	0.12238	0.55676	
17	0.00054	0.02619	0.01310	0.91815	0.01194	0.02388	1.08914	1.51430	0.01544	0.01133	0.01320	0.03066	2.05983	0.04713	2.07766	0.07006	0.02894	0.02371	0.81924	
18	0.00946	0.10977	0.05489	0.70056	0.04533	0.09065	1.42744	1.63533	0.07292	0.03308	0.05593	0.13850	2.14645	0.13376	2.25346	0.04841	0.14473	0.08325	0.57523	
19	0.01547	0.14035	0.07018	0.69829	0.05802	0.11604	1.43206	1.59595	0.09626	0.05409	0.07146	0.17543	1.05093	0.22165	1.08533	0.05095	0.17281	0.11399	0.65965	
20	0.00098	0.03541	0.01771	0.85984	0.01581	0.03161	1.16301	1.52863	0.02120	0.01514	0.01785	0.04215	2.05856	0.10700	2.08021	0.07261	0.03956	0.03170	0.80132	
21	0.00131	0.04078	0.02039	0.79560	0.01757	0.03514	1.25692	1.59574	0.02550	0.01460	0.02056	0.04976	0.65859	0.12356	0.69680	0.09427	0.04953	0.03358	0.67792	
22	0.00521	0.08143	0.04071	0.46491	0.02715	0.05430	2.15094	2.18620	0.06093	0.01019	0.04094	0.11774	1.47003	0.22038	1.49042	0.10573	0.12585	0.05268	0.41860	
23	0.00202	0.05076	0.02538	0.71291	0.02082	0.04164	1.40270	1.86007	0.03450	0.01798	0.02572	0.06726	1.80506	0.11592	1.86111	0.15032	0.06359	0.04051	0.63709	
24	0.00679	0.09295	0.04648	0.31831	0.02560	0.05121	3.14157	1.85524	0.06848	0.00443	0.04147	0.12362	0.29299	0.12356	0.30190	0.22165	0.12942	0.06676	0.51584	
25	0.00343	0.06607	0.03304	0.66221	0.02627	0.05255	1.51010	2.15594	0.04870	0.01704	0.03428	0.09481	1.16940	0.12866	1.21908	0.20764	0.09415	0.04637	0.49253	
26	0.01291	0.12823	0.06411	0.67763	0.05216	0.10432	1.47574	1.51290	0.07954	0.03784	0.06366	0.15588	0.62929	0.24076	0.76559	0.18815	0.15603	0.10537	0.67533	
27	0.00105	0.03653	0.01827	0.75090	0.01522	0.03043	1.33173	2.17167	0.02616	0.01200	0.01916	0.05176	0.78597	0.19108	0.80381	0.14395	0.05357	0.02492	0.46509	
28	0.00057	0.02693	0.01346	0.84073	0.01172	0.02345	1.18945	1.81383	0.01726	0.01037	0.01366	0.03444	0.03439	0.14904	0.06115	0.16815	0.03223	0.02250	0.69809	
29	0.00029	0.01928	0.00964	0.85489	0.00830	0.01660	1.16974	1.69330	0.01207	0.00830	0.00978	0.02336	1.99359	0.14904	2.01015	0.16305	0.02209	0.01684	0.76212	
30	0.01640	0.14451	0.07226	0.38232	0.04406	0.08812	2.61563	2.48617	0.12131	0.04338	0.07429	0.22470	1.26494	0.32738	1.43309	0.18089	0.22635	0.09226	0.40762	
31	0.00657	0.09149	0.04574	0.80372	0.04040	0.08080	1.24421	1.48612	0.05621	0.03648	0.04613	0.10988	2.29932	0.25859	2.37447	0.18089	0.10807	0.07745	0.71671	
32	0.00034	0.02068	0.01034	0.85447	0.00894	0.01788	1.17031	1.81815	0.01304	0.00888	0.01050	0.02608	1.93754	0.19235	1.95537	0.17579	0.02368	0.01806	0.76270	
33	0.00031	0.01992	0.00996	0.86342	0.00863	0.01726	1.15818	1.84357	0.01261	0.00894	0.01012	0.02522	1.95920	0.19235	1.97576	0.17579	0.02260	0.01755	0.77640	
34	0.00040	0.02259	0.01130	0.86643	0.00990	0.01980	1.15416	1.71785	0.01421	0.00999	0.01144	0.02788	0.01146	0.19235	0.02930	0.21146	0.02546	0.02004	0.78707	
35	0.01685	0.14649	0.07324	0.65338	0.05859	0.11717	1.53051	1.81849	0.09906	0.04185	0.07366	0.19548	1.69678	0.20000	1.83054	0.34012	0.18602	0.11536	0.62016	
36	0.00042	0.02318	0.01159	0.87700	0.01024	0.02048	1.14025	1.62774	0.01442	0.00993	0.01174	0.02790	0.99616	0.20127	1.01272	0.22165	0.02624	0.02047	0.78002	
37	0.01565	0.14115	0.07058	0.45724	0.04710	0.09421	2.18703	2.59506	0.12715	0.03805	0.07513	0.22443	0.13630	0.21019	0.28662	0.37451	0.22222	0.08966	0.40346	
38	0.00366	0.06823	0.03411	0.67161	0.02735	0.05469	1.48896	1.75595	0.04572	0.01766	0.03407	0.08843	1.59742	0.21019	1.62799	0.29171	0.08760	0.05314	0.60657	
39	0.04468	0.23851	0.11926	0.74435	0.10227	0.20455	1.34345	1.24697	0.13792	0.09804	0.11938	0.26475	1.90060	0.46368	2.07002	0.26241	0.26451	0.21507	0.81308	
40	0.01163	0.12171	0.06086	0.51117	0.04289	0.08579	1.95630	1.69113	0.09477	0.03703	0.06263	0.15603	1.09679	0.34776	1.24329	0.29808	0.16650	0.08897	0.53440	
41	0.00847	0.10387	0.05194	0.60810	0.03989	0.07979	1.64445	2.22940	0.07792	0.02801	0.05477	0.15277	2.34135	0.27133	2.48148	0.32866	0.15711	0.06867	0.43710	
42	0.00709	0.09502	0.04751	0.63096	0.03712	0.07425	1.58488	2.03428	0.07711	0.02918	0.04968	0.13331	1.00253	0.34776	1.09807	0.25732	0.13660	0.06610	0.48385	
43	0.00203	0.05082	0.02541	0.56108	0.01843	0.03685	1.78227	2.66761	0.04293	0.00802	0.02713	0.08035	2.49804	0.26114	2.53880	0.32866	0.08589	0.03007	0.35009	
44	0.01507	0.13852	0.06926	0.51074	0.04888	0.09776	1.95793	1.86974	0.09704	0.02590	0.06796	0.18705	0.58215	0.35031	0.76559	0.32101	0.20150	0.09523	0.47258	
45	0.00080	0.03201	0.01601	0.84763	0.01411	0.02823	1.17976	1.67091	0.02030	0.01287	0.01619	0.03963	2.57702	0.28152	2.60377	0.30827	0.03691	0.02776	0.75219	
46	0.00610	0.08813	0.04406	0.70756	0.03645	0.07289	1.41330	1.39247	0.05742	0.02835	0.04437	0.10226	0.32101	0.29426	0.37834	0.37706	0.10895	0.07129	0.65433	
47	0.01740	0.14885	0.07443	0.49489	0.05174	0.10348	2.02064	2.37504	0.11613	0.03647	0.07507	0.22670	1.50443	0.29299	1.56685	0.50954	0.23144	0.09573	0.41364	
48	0.00103	0.03622	0.01811	0.84578	0.01604	0.03208	1.18233	1.51005	0.02323	0.01555	0.01831	0.04287	2.25855	0.31464	2.28148	0.34904	0.04108	0.03194	0.77739	
49	0.00298	0.06164	0.03082	0.81228	0.02716	0.05432	1.23111	1.42989	0.03662	0.02440	0.03112	0.07207	0.82546	0.32483	0.87259	0.37706	0.07231	0.05255	0.72671	
50	0.00408	0.07210	0.03605	0.54463	0.02598	0.05196	1.83612	2.90683	0.06349	0.01862	0.03987	0.12003	2.58593	0.45604	2.60504	0.33885	0.12207	0.04258	0.34885	
51	0.01316	0.12944	0.06472																	



Appendix 2-18 Roundness of the Opaque Minerals

Karaotkel Pit Conc.

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾角X	絶対最大長傾角Y	絶対最大長傾角Z	絶対最大長傾角W	楕円長軸	楕円短軸	楕円長短比
52	0.00148	0.04334	0.02167	0.70105	0.01752	0.03504	1.42643	2.14918	0.03214	0.01337	0.02252	0.06135	0.00255	0.40891	0.05478	0.37961	0.06212	0.03023	0.48664
53	0.00508	0.08043	0.04021	0.77312	0.03474	0.06948	1.29346	1.48718	0.05201	0.02629	0.04056	0.09637	0.82291	0.38598	0.89170	0.45095	0.09549	0.06775	0.70946
54	0.02143	0.16520	0.08260	0.62104	0.06448	0.12895	1.61021	1.75690	0.11690	0.04378	0.08399	0.21689	0.46368	0.39872	0.57451	0.58343	0.23195	0.11766	0.50729
55	0.01419	0.13443	0.06721	0.65360	0.05372	0.10745	1.52998	1.65205	0.09554	0.04181	0.06812	0.17082	0.93501	0.38598	1.03183	0.52483	0.16994	0.10633	0.62572
56	0.03435	0.20912	0.10456	0.42248	0.06734	0.13468	2.36695	2.50393	0.17051	0.02775	0.10480	0.32788	1.17068	0.54394	1.46494	0.40254	0.34470	0.12687	0.36806
57	0.00120	0.03907	0.01954	0.85194	0.01742	0.03484	1.17379	1.54108	0.02455	0.01522	0.01973	0.04686	1.07641	0.39362	1.10571	0.42802	0.04515	0.03381	0.74884
58	0.00198	0.05025	0.02512	0.58730	0.01864	0.03727	1.70270	2.94664	0.04413	0.01280	0.02722	0.08349	1.10444	0.44967	1.17322	0.40509	0.08323	0.03033	0.36443
59	0.00824	0.10244	0.05122	0.73844	0.04340	0.08680	1.35420	1.93520	0.07128	0.02800	0.05222	0.14052	0.28789	0.51082	0.38853	0.41528	0.13735	0.07640	0.55625
60	0.00865	0.10492	0.05246	0.70490	0.04342	0.08684	1.41864	1.92080	0.07353	0.03381	0.05343	0.14336	2.34900	0.41910	2.44326	0.52483	0.13652	0.08064	0.59065
61	0.00057	0.02704	0.01352	0.80703	0.01152	0.02304	1.23911	1.68424	0.01708	0.01132	0.01373	0.03329	0.72865	0.41910	0.75158	0.44076	0.03124	0.02341	0.74929
62	0.00725	0.09609	0.04805	0.43070	0.03091	0.06182	2.32182	2.93217	0.08229	0.02122	0.05167	0.16130	2.53880	0.43311	2.58593	0.58598	0.16393	0.05633	0.34360
63	0.00674	0.09266	0.04633	0.67933	0.03756	0.07513	1.47204	1.92629	0.06395	0.02579	0.04804	0.12651	1.81907	0.43439	1.86620	0.55031	0.13112	0.06549	0.49948
64	0.00097	0.03512	0.01756	0.79745	0.01506	0.03012	1.25399	1.81009	0.02352	0.01299	0.01805	0.04537	1.05858	0.44203	1.09934	0.45859	0.04585	0.02690	0.58664
65	0.03144	0.20009	0.10004	0.37217	0.06042	0.12083	2.68694	2.52554	0.16220	0.02022	0.09880	0.31476	0.54139	0.65604	0.79616	0.47388	0.36282	0.11034	0.30413
66	0.00942	0.10953	0.05477	0.55646	0.04024	0.08048	1.79707	1.50958	0.06804	0.03616	0.05468	0.13256	0.16688	0.47770	0.25350	0.57578	0.13465	0.08910	0.66175
67	0.00658	0.09153	0.04577	0.72822	0.03843	0.07686	1.37320	1.46924	0.05835	0.03349	0.04606	0.10918	1.87130	0.55668	1.95283	0.48661	0.11029	0.07596	0.68872
68	0.03489	0.21076	0.10538	0.59868	0.08093	0.16186	1.67034	1.75523	0.14973	0.05649	0.10551	0.27714	0.84839	0.48789	0.89807	0.75922	0.28445	0.15617	0.54901
69	0.00197	0.05012	0.02506	0.72708	0.02075	0.04151	1.37537	2.03232	0.03545	0.01625	0.02564	0.06940	0.10420	0.53884	1.09297	0.49426	0.06529	0.03848	0.58935
70	0.00427	0.07373	0.03686	0.63033	0.02865	0.05730	1.58646	2.11942	0.05926	0.02260	0.03825	0.10507	1.45729	0.49298	1.51207	0.58088	0.10347	0.05253	0.50770
71	0.00044	0.02379	0.01190	0.87369	0.01050	0.02101	1.14458	1.74427	0.01526	0.01062	0.01204	0.02968	2.27002	0.53120	2.29040	0.51209	0.02682	0.02111	0.78695
72	0.00039	0.02218	0.01109	0.84492	0.00957	0.01915	1.18354	1.67658	0.01388	0.00957	0.01124	0.02697	1.71844	0.52610	1.73754	0.54266	0.02550	0.01929	0.75647
73	0.02609	0.18224	0.09112	0.73320	0.07741	0.15481	1.36388	1.32438	0.11082	0.06495	0.09159	0.20807	0.32356	0.71718	0.47133	0.57324	0.21057	0.15773	0.74904
74	0.00922	0.10833	0.05417	0.60149	0.04139	0.08279	1.66254	1.71835	0.07578	0.03810	0.05550	0.13993	2.33881	0.60254	2.46492	0.54521	0.14158	0.08289	0.58542
75	0.00142	0.04254	0.02127	0.63418	0.01632	0.03265	1.57684	2.47598	0.03375	0.01041	0.02210	0.06451	0.00255	0.53629	0.05350	0.57324	0.06372	0.02840	0.44571
76	0.05741	0.27036	0.13518	0.16533	0.05435	0.10870	6.04839	2.86067	0.24410	0.03147	0.13833	0.45216	1.11717	0.54139	1.21781	0.98087	0.52676	0.13876	0.26343
77	0.02554	0.18033	0.09017	0.45200	0.06000	0.12000	2.21238	2.03285	0.14460	0.05326	0.09612	0.25448	1.54010	0.54903	1.58213	0.79871	0.26694	0.12183	0.45637
78	0.01421	0.13449	0.06724	0.63478	0.05297	0.10594	1.57535	2.19330	0.10568	0.04030	0.06990	0.19692	1.76684	0.58470	1.93117	0.69043	0.19628	0.09215	0.46948
79	0.00644	0.09058	0.04529	0.68452	0.03686	0.07372	1.46088	1.66651	0.06195	0.03237	0.04606	0.11502	2.27002	0.56050	2.29549	0.67132	0.11781	0.06964	0.59111
80	0.00083	0.03259	0.01629	0.71899	0.01320	0.02640	1.39084	1.93082	0.02226	0.01052	0.01644	0.04325	0.00382	0.64203	0.03057	0.61018	0.04119	0.02578	0.62588
81	0.01941	0.15720	0.07860	0.72916	0.06651	0.13301	1.37145	1.62450	0.10479	0.05567	0.07926	0.19853	0.64330	0.75795	0.80253	0.64203	0.19143	0.12910	0.67439
82	0.00263	0.05785	0.02893	0.53608	0.02057	0.04113	1.86540	2.76356	0.04986	0.00816	0.03069	0.09339	0.00255	0.70190	0.05350	0.62546	0.09677	0.03459	0.35742
83	0.00499	0.07973	0.03987	0.61817	0.03073	0.06146	1.61768	2.24328	0.06208	0.01884	0.04144	0.11708	2.02034	0.64967	2.07002	0.75412	0.11927	0.05330	0.44695
84	0.02223	0.16826	0.08413	0.60650	0.06490	0.12980	1.64880	1.68238	0.11840	0.04333	0.08459	0.21618	1.33500	0.88533	1.48405	0.73120	0.22155	0.12778	0.57675
85	0.00494	0.07932	0.03966	0.79604	0.03477	0.06953	1.25622	1.42052	0.04896	0.03148	0.03995	0.09288	0.45859	0.77578	0.51846	0.70699	0.09125	0.06895	0.75557
86	0.03018	0.19602	0.09801	0.48951	0.06796	0.13593	2.04286	1.92224	0.15248	0.04400	0.09921	0.26936	0.11974	0.72228	0.31337	0.90699	0.27939	0.13754	0.49228
87	0.00487	0.07873	0.03936	0.80227	0.03464	0.06928	1.24646	1.35611	0.04818	0.03084	0.03963	0.09008	0.02930	0.73756	0.11210	0.76941	0.09129	0.06790	0.74383
88	0.01705	0.14736	0.07368	0.75800	0.06353	0.12706	1.31926	1.49703	0.09554	0.05766	0.07447	0.17857	1.95792	0.89043	1.98085	0.71463	0.17708	0.12263	0.69250
89	0.00109	0.03723	0.01862	0.81168	0.01615	0.03230	1.23201	1.70832	0.02408	0.01542	0.01889	0.04686	0.25754	0.80890	2.60504	0.77451	0.04311	0.03216	0.74588
90	0.00466	0.07700	0.03850	0.60371	0.02929	0.05859	1.65641	1.97877	0.05678	0.01972	0.03858	0.10607	0.91336	0.86240	0.97705	0.77960	0.10759	0.05511	0.51224
91	0.00036	0.02132	0.01066	0.81870	0.00902	0.01804	1.22145	1.84237	0.01355	0.00825	0.01088	0.02707	2.55154	0.78342	2.57192	0.79871	0.02592	0.01754	0.67680
92	0.01723	0.14813	0.07406	0.40742	0.04665	0.09331	2.45445	2.45755	0.11679	0.00382	0.07173	0.22917	1.62162	0.93374	1.80761	0.80253	0.24379	0.09000	0.36919
93	0.01563	0.14106	0.07053	0.33981	0.04050	0.08100	2.94283	2.26686	0.11123	0.01115	0.06687	0.20920	0.51209	0.79361	0.57706	0.99106	0.23373	0.08513	0.36424
94	0.00355	0.06720	0.03360	0.71230	0.02774	0.05549	1.40390	1.91638	0.04606	0.02396	0.03429	0.09101	1.85983	0.81400	1.93244	0.86622	0.08656	0.05218	0.60278
95	0.00846	0.10376	0.05188	0.47339	0.03508	0.07016	2.11243	2.27584	0.07796	0.01664	0.05240	0.15383	2.48020	0.81400	2.59867	0.90954	0.15708	0.06854	0.43636
96	0.00145	0.04291	0.02145	0.82614	0.01888	0.03776	1.21046	1.58191	0.02721	0.01492	0.02157	0.05226	2.35791	0.85858	2.39103	0.89680	0.05097	0.03612	0.70872
97	0.00587	0.08645	0.04322	0.72097	0.03609	0.07218	1.38703	1.58067	0.05657	0.02874	0.04383	0.10687	1.79105	0.88533	1.88404	0.93501	0.10635	0.07027	0.66074
98	0.00227	0.05371	0.02685	0.69976	0.02184	0.04369	1.42905	1.93514	0.03856	0.01554	0.02786	0.07265	2.30059	0.93756	2.32352	0.87005	0.07754	0.03720	0.47969
99	0.00122	0.03936	0.01968	0.73617	0.01628	0.03256	1.35838	2.14238	0.02820	0.01322	0.02041	0.05554	0.88151	0.88533	0.92992	0.90954	0.05508	0.02813	0.51072
100	0.00254	0.05683	0.02841	0.75069	0.02401	0.04802	1.33211	1.56350	0.03566	0.02053	0.02869	0.06930	1.32481	0.95539	1.35156	0.89298	0.06843	0.04719	0.68968
101	0.01476	0.13707	0.06853	0.52338	0.04896	0.09792	1.91064	2.25302	0.10367	0.02687	0.07076	0.20316	1.38851	1.03820	1.54774	0.91463	0.22196	0.08464	0.38134
102	0.03010	0.19576	0.09788	0.31820															



Appendix 2-18 Roundness of the Opaque Minerals

Karaotkel Pit Conc.

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾角X	絶対最大長傾角Y	絶対最大長傾角Z	楕円長軸	楕円短軸	楕円長短比	
103	0.00345	0.06625	0.03312	0.78192	0.02867	0.05734	1.27890	1.63998	0.04539	0.02498	0.03349	0.08305	0.44458	0.98979	0.49681	0.92737	0.07849	0.05591	0.71231
104	0.01177	0.12243	0.06122	0.39557	0.03789	0.07578	2.57297	2.57297	0.10163	0.01026	0.06194	0.19334	0.84075	0.96431	1.03055	0.99361	0.22445	0.06678	0.29754
105	0.00838	0.10331	0.05166	0.52864	0.03695	0.07389	1.89165	2.33505	0.08063	0.03381	0.05296	0.15530	0.09936	0.94393	0.23057	1.02418	0.14263	0.07483	0.52467
106	0.02662	0.18411	0.09206	0.58125	0.06957	0.13914	1.72044	1.72095	0.13094	0.06740	0.09442	0.23942	1.88659	1.15284	2.09295	1.03437	0.24052	0.14093	0.58592
107	0.01511	0.13871	0.06935	0.54221	0.05045	0.10090	1.84431	2.18482	0.10422	0.02935	0.07104	0.20255	1.68404	0.95539	1.73882	1.14902	0.20665	0.09310	0.45054
108	0.02535	0.17965	0.08982	0.44378	0.05923	0.11846	2.25335	2.44694	0.15898	0.03887	0.09320	0.27815	1.09170	0.96431	1.27131	1.17450	0.28336	0.11389	0.40194
109	0.00951	0.11002	0.05501	0.65147	0.04379	0.08759	1.53500	2.02012	0.08154	0.03790	0.05665	0.15424	0.33885	1.09934	0.42674	0.97450	0.14572	0.08307	0.57007
110	0.00612	0.08828	0.04414	0.53230	0.03159	0.06318	1.87862	2.47735	0.07429	0.01779	0.04760	0.13630	1.53373	1.11590	1.57449	0.98724	0.14435	0.05399	0.37400
111	0.00080	0.03195	0.01597	0.81904	0.01384	0.02769	1.22094	1.91235	0.02126	0.01040	0.01623	0.04231	0.31082	1.01781	0.33885	0.98851	0.03929	0.02598	0.66108
112	0.00948	0.10989	0.05495	0.65896	0.04399	0.08797	1.51754	2.04377	0.08129	0.03304	0.05617	0.15493	0.72483	1.00253	0.83565	1.10826	0.14800	0.08160	0.55133
113	0.00914	0.10790	0.05395	0.49187	0.03722	0.07444	2.03306	2.15602	0.07914	0.02600	0.05426	0.15584	1.31207	1.15284	1.36812	1.00890	0.14827	0.07852	0.52958
114	0.00571	0.08527	0.04263	0.53592	0.03059	0.06118	1.86596	1.79276	0.06294	0.01200	0.04146	0.11190	0.89680	1.13501	0.91208	1.02546	0.11942	0.06088	0.50980
115	0.00399	0.07123	0.03562	0.58442	0.02661	0.05322	1.71111	1.67956	0.04768	0.01903	0.03572	0.09022	0.13885	1.11463	0.18598	1.03947	0.09447	0.05371	0.56860
116	0.00257	0.05719	0.02859	0.62603	0.02201	0.04401	1.59737	1.92879	0.04072	0.01197	0.02897	0.07725	0.08535	1.10189	0.14649	1.05730	0.07910	0.04135	0.52274
117	0.00084	0.03262	0.01631	0.81904	0.01415	0.02829	1.22095	1.79472	0.02111	0.01160	0.01667	0.04188	0.26369	1.06877	0.30063	1.08533	0.04231	0.02515	0.59428
118	0.01272	0.12726	0.06363	0.67535	0.05167	0.10334	1.48070	1.64089	0.08453	0.04294	0.06475	0.16109	2.07384	1.08405	2.22798	1.12609	0.16557	0.09781	0.59074
119	0.00405	0.07181	0.03591	0.63752	0.02805	0.05611	1.56857	2.19176	0.05340	0.01743	0.03676	0.10403	1.40507	1.16176	1.46366	1.07768	0.10410	0.04954	0.47592
120	0.01656	0.14520	0.07260	0.62482	0.05677	0.11354	1.60047	1.53134	0.09306	0.05106	0.07389	0.17775	0.35795	1.18342	0.52993	1.22290	0.18020	0.11699	0.64923
121	0.01191	0.12314	0.06157	0.53865	0.04458	0.08915	1.85651	2.91370	0.11309	0.03244	0.06797	0.20735	2.27002	1.11717	2.44963	1.21781	0.21481	0.07059	0.32860
122	0.01302	0.12873	0.06437	0.61823	0.04999	0.09997	1.61751	1.73436	0.08863	0.04961	0.06485	0.16745	0.17197	1.14265	0.30573	1.24074	0.15845	0.10459	0.66007
123	0.00254	0.05686	0.02843	0.78364	0.02456	0.04912	1.27609	1.41294	0.03582	0.02181	0.02875	0.06595	0.58852	1.12991	0.61273	1.18978	0.06751	0.04790	0.70950
124	0.00370	0.06866	0.03433	0.59215	0.02580	0.05159	1.68877	1.47430	0.04306	0.01112	0.03332	0.08140	0.00892	1.20634	0.07134	1.15666	0.08635	0.05460	0.63237
125	0.00900	0.10703	0.05351	0.66018	0.04287	0.08573	1.51475	1.83548	0.07234	0.03789	0.05418	0.14295	2.22925	1.29042	2.25728	1.15157	0.13761	0.08324	0.60489
126	0.01554	0.14064	0.07032	0.61929	0.05472	0.10944	1.61475	2.49559	0.11297	0.04033	0.07451	0.21970	0.61910	1.33118	0.74648	1.15412	0.21857	0.09050	0.41407
127	0.01414	0.13417	0.06709	0.71550	0.05613	0.11226	1.39763	1.78261	0.09241	0.04929	0.06846	0.17719	1.39105	1.20125	1.53500	1.30188	0.17121	0.10515	0.61141
128	0.01108	0.11880	0.05940	0.54400	0.04320	0.08640	1.83823	2.31264	0.09774	0.02355	0.06186	0.17815	1.79487	1.19106	1.90060	1.33246	0.19296	0.07314	0.37906
129	0.01358	0.13151	0.06576	0.36938	0.03935	0.07869	2.70720	2.31232	0.10279	0.03210	0.06652	0.19688	1.11463	1.23692	1.30953	1.25348	0.20358	0.08496	0.41733
130	0.00229	0.05401	0.02701	0.71622	0.02224	0.04448	1.39622	2.21377	0.04163	0.01622	0.02812	0.07820	2.48530	1.27004	2.52606	1.20057	0.07752	0.03763	0.48543
131	0.00356	0.06734	0.03367	0.75773	0.02870	0.05740	1.31974	1.98902	0.04688	0.02025	0.03468	0.09300	2.51715	1.29551	2.57574	1.22545	0.09225	0.04916	0.53290
132	0.00263	0.05789	0.02894	0.75986	0.02462	0.04923	1.31603	1.79861	0.03833	0.01884	0.02938	0.07575	2.31588	1.28278	2.37702	1.24074	0.07509	0.04463	0.59437
133	0.01649	0.14491	0.07245	0.58717	0.05490	0.10980	1.70310	1.97413	0.10257	0.03206	0.07340	0.20133	0.92737	1.41271	1.05730	1.26112	0.21200	0.09905	0.46719
134	0.00530	0.08213	0.04107	0.76445	0.03529	0.07058	1.30812	1.87368	0.05557	0.02999	0.04166	0.11050	1.31080	1.32099	1.40507	1.26622	0.10373	0.06503	0.62696
135	0.03231	0.20283	0.10141	0.78040	0.08897	0.17793	1.28139	1.50476	0.12561	0.07608	0.10214	0.24708	1.69423	1.49678	1.82926	1.29169	0.24470	0.16812	0.68706
136	0.00775	0.09932	0.04966	0.61851	0.03844	0.07688	1.61679	2.48948	0.07807	0.02270	0.05184	0.15424	0.43693	1.28660	0.53757	1.40125	0.15055	0.06552	0.43520
137	0.00670	0.09236	0.04618	0.50615	0.03223	0.06447	1.97571	2.27541	0.07238	0.02385	0.04870	0.13669	2.47638	1.33883	2.60504	1.29579	0.14371	0.05936	0.41305
138	0.00029	0.01928	0.00964	0.85489	0.00830	0.01660	1.16974	1.69330	0.01207	0.00830	0.00978	0.02336	1.99232	1.30061	2.00888	1.31462	0.02209	0.01684	0.76212
139	0.00278	0.05953	0.02976	0.63769	0.02316	0.04631	1.56815	2.76095	0.04868	0.01506	0.03162	0.09637	1.38851	1.34137	1.45475	1.40889	0.09441	0.03753	0.39757
140	0.00083	0.03256	0.01628	0.64542	0.01246	0.02493	1.54938	2.27556	0.02387	0.00674	0.01654	0.04681	0.13885	1.37832	0.16942	1.34520	0.04662	0.02273	0.48762
141	0.00223	0.05334	0.02667	0.65239	0.02093	0.04187	1.53283	1.77426	0.03765	0.01667	0.02714	0.06905	1.20762	1.35921	1.27259	1.37832	0.07064	0.04028	0.57022
142	0.00696	0.09417	0.04708	0.66897	0.03789	0.07578	1.49483	1.44680	0.06069	0.03135	0.04700	0.11144	1.31080	1.44328	1.37322	1.35284	0.11070	0.08011	0.72368
143	0.00107	0.03687	0.01844	0.74522	0.01530	0.03060	1.34189	1.73933	0.02405	0.00959	0.01865	0.04674	0.07898	1.36176	0.11720	1.38596	0.04770	0.02850	0.59756
144	0.00985	0.11198	0.05599	0.74879	0.04783	0.09566	1.33548	1.76595	0.07667	0.03723	0.05741	0.14691	2.29804	1.38468	2.43180	1.44201	0.14864	0.08436	0.56754
145	0.01005	0.11314	0.05657	0.54518	0.04115	0.08231	1.83426	2.40532	0.09100	0.02476	0.05832	0.17289	0.59617	1.37195	0.74011	1.46494	0.17277	0.07409	0.42883
146	0.00396	0.07099	0.03549	0.73405	0.02979	0.05958	1.36230	1.63411	0.04759	0.02482	0.03617	0.08889	2.03181	1.36303	2.06365	1.44456	0.08836	0.05703	0.64545
147	0.00870	0.10523	0.05262	0.67905	0.04273	0.08547	1.47265	1.96614	0.08000	0.03373	0.05469	0.14543	2.55027	1.50061	2.60377	1.36685	0.14554	0.07609	0.52285
148	0.00620	0.08886	0.04443	0.48961	0.03047	0.06094	2.04246	3.31987	0.09258	0.01999	0.05200	0.15869	1.15921	1.37449	1.19106	1.52863	0.16938	0.04662	0.27525
149	0.00351	0.06680	0.03340	0.71470	0.02782	0.05525	1.39919	1.73085	0.04602	0.02398	0.03387	0.08598	0.26114	1.46112	0.33120	1.41398	0.08179	0.05456	0.66710
150	0.00426	0.07363	0.03682	0.59573	0.02780	0.05560	1.67862	2.06886	0.05420	0.02160	0.03800	0.10361	0.47388	1.47895	0.54266	1.40379	0.10532	0.05148	0.48877
151	0.03327	0.20581	0.10291	0.75483	0.08879	0.17758	1.32481	1.72808	0.13594	0.07439	0.10527	0.26870	2.10187	1.44838	2.35154	1.54392	0.26685	0.15874	0.59485
152	0.00910	0.10761	0.05381	0.47660	0.03653	0.07307	2.09821	2.64660	0.08901	0.02472	0.05610	0.17219	0.33885	1.45093	0.48024	1.54647	0.16260	0.07122	0.43801
153	0.00549																		



Appendix 2-18 Roundness of the Opaque Minerals

Karatokel Pit Conc.

番号	面積	円相当径	半径	円形度	サイズ	流体直径	凹凸度	線形度	重心距離最大	重心距離最小	重心距離平均	絶対最大長	絶対最大長傾角X	絶対最大長傾角Y	絶対最大長傾角X	絶対最大長傾角Y	楕円長軸	楕円短軸	楕円長短比
154	0.00709	0.09500	0.04750	0.45245	0.03134	0.06267	2.21017	2.48155	0.08071	0.01978	0.04922	0.14678	0.18981	1.49933	0.32229	1.55920	0.15169	0.05950	0.39223
155	0.02303	0.17124	0.08562	0.68692	0.07034	0.14068	1.45577	1.38741	0.10941	0.06304	0.08614	0.19993	0.89680	1.68022	0.97578	1.49806	0.20556	0.14264	0.69391
156	0.01748	0.14918	0.07459	0.60364	0.05733	0.11467	1.65661	1.86281	0.10644	0.04191	0.07570	0.20144	1.58595	1.68786	1.67895	1.51080	0.21044	0.10575	0.50251
157	0.01140	0.12047	0.06023	0.55333	0.04419	0.08839	1.80724	1.98456	0.08423	0.02735	0.06092	0.16739	1.41398	1.60888	1.57322	1.56175	0.17538	0.08275	0.47180
158	0.00101	0.03585	0.01792	0.77963	0.01522	0.03045	1.28266	2.10130	0.02516	0.01345	0.01840	0.04999	2.57574	1.52354	2.60377	1.56303	0.04703	0.02732	0.58098
159	0.00562	0.08460	0.04230	0.60498	0.03229	0.06457	1.65295	2.40152	0.07181	0.02095	0.04447	0.12866	1.32227	1.65984	1.38468	1.54901	0.13377	0.05350	0.39997
160	0.00409	0.07214	0.03607	0.49199	0.02468	0.04937	2.03257	2.74261	0.05911	0.02045	0.03859	0.11656	2.05473	1.60379	2.16683	1.57704	0.11551	0.04506	0.39005
161	0.01169	0.12198	0.06099	0.59152	0.04628	0.09257	1.69055	1.86478	0.08892	0.02824	0.06199	0.16435	2.30314	1.66748	2.45473	1.60761	0.16563	0.08982	0.54231
162	0.00311	0.06292	0.03146	0.65426	0.02483	0.04967	1.52845	2.38557	0.04982	0.01656	0.03337	0.09484	1.72863	1.59360	1.81652	1.56175	0.09662	0.04097	0.42407
163	0.02578	0.18119	0.09060	0.32649	0.05114	0.10228	3.06292	1.56490	0.11899	0.00671	0.08194	0.22393	0.16560	1.78850	0.27515	1.59487	0.23957	0.13704	0.57204
164	0.00078	0.03149	0.01575	0.50111	0.01053	0.02106	1.99555	2.98463	0.02578	0.00428	0.01614	0.05140	0.13376	1.61908	0.16560	1.58086	0.05431	0.01826	0.33619
165	0.00539	0.08285	0.04142	0.63312	0.03234	0.06468	1.57948	1.94961	0.05818	0.01879	0.04175	0.11350	0.65731	1.62927	0.76686	1.60506	0.12100	0.05673	0.46882
166	0.00155	0.04444	0.02222	0.64774	0.01728	0.03455	1.54383	1.83413	0.02989	0.00811	0.02222	0.05814	2.56937	1.60506	2.60249	1.65092	0.06056	0.03261	0.53854
167	0.00060	0.02769	0.01384	0.78721	0.01166	0.02332	1.27031	1.88115	0.01891	0.00911	0.01406	0.03606	0.03694	1.63691	0.05860	1.61016	0.03434	0.02232	0.64984
168	0.00068	0.02942	0.01471	0.82996	0.01278	0.02556	1.20488	1.69240	0.01870	0.01146	0.01494	0.03650	1.82289	1.62927	1.85219	1.61016	0.03612	0.02396	0.66340
169	0.01487	0.13759	0.06879	0.50204	0.04813	0.09625	1.99185	2.06075	0.10198	0.01872	0.06674	0.19501	1.91843	1.62672	2.07130	1.74519	0.20225	0.09360	0.46279
170	0.00119	0.03892	0.01946	0.82604	0.01708	0.03415	1.21060	1.71663	0.02502	0.01379	0.01970	0.04924	2.44836	1.65474	2.48785	1.62799	0.04743	0.03193	0.67332
171	0.00319	0.06377	0.03188	0.69541	0.02597	0.05194	1.43801	2.09968	0.04748	0.01776	0.03290	0.09026	0.32738	1.63181	0.37834	1.70442	0.08826	0.04607	0.52197
172	0.00694	0.09403	0.04701	0.61325	0.03620	0.07239	1.63065	1.53649	0.05903	0.03061	0.04695	0.11459	2.12607	1.64328	2.18849	1.73754	0.11354	0.07787	0.68583
173	0.00811	0.10160	0.05080	0.52496	0.03619	0.07238	1.90491	1.99071	0.07489	0.02417	0.05263	0.14095	1.76939	1.76684	1.85856	1.65984	0.15407	0.06700	0.43485
174	0.00133	0.04111	0.02056	0.72549	0.01689	0.03379	1.37838	2.38378	0.03119	0.01364	0.02154	0.06124	2.38594	1.67512	2.43944	1.64837	0.05972	0.02830	0.47389
175	0.00068	0.02953	0.01476	0.78124	0.01243	0.02486	1.28002	2.16586	0.02114	0.01013	0.01511	0.04140	1.50443	1.69296	1.53373	1.66621	0.03858	0.02260	0.58582
176	0.01445	0.13563	0.06782	0.51871	0.04823	0.09645	1.92786	2.38407	0.11553	0.03509	0.07169	0.20679	0.70827	1.67003	0.90317	1.73500	0.19778	0.09302	0.47031
177	0.00490	0.07900	0.03950	0.81068	0.03495	0.06989	1.23353	1.47556	0.04932	0.03197	0.03997	0.09429	1.44328	1.75665	1.48277	1.67258	0.09270	0.06733	0.72639
178	0.00386	0.07008	0.03504	0.63779	0.02737	0.05473	1.56792	2.49344	0.05696	0.02023	0.03646	0.10822	1.70188	1.75156	1.77194	1.67130	0.10188	0.04820	0.47312
179	0.01470	0.13682	0.06841	0.49567	0.04754	0.09509	2.01747	2.45372	0.11952	0.03225	0.07207	0.21157	1.24201	1.81780	1.40379	1.68404	0.20402	0.09175	0.44971
180	0.01301	0.12873	0.06436	0.68345	0.05259	0.10519	1.46318	1.39103	0.07516	0.04543	0.06409	0.15006	0.32611	1.80251	0.46878	1.76047	0.14676	0.11291	0.76938
181	0.01156	0.12133	0.06067	0.66474	0.04885	0.09769	1.50434	2.04987	0.09087	0.03649	0.06313	0.17155	2.17575	1.79996	2.34390	1.77321	0.17326	0.08496	0.49037
182	0.01322	0.12974	0.06487	0.70644	0.05391	0.10782	1.41555	1.72229	0.09095	0.04083	0.06578	0.16835	0.93756	1.72481	1.01017	1.87512	0.16894	0.09964	0.58978
183	0.00390	0.07049	0.03525	0.74851	0.02988	0.05975	1.33600	1.45198	0.04494	0.02579	0.03555	0.08322	1.35793	1.73627	1.43437	1.76557	0.08471	0.05866	0.69239
184	0.00039	0.02218	0.01109	0.84492	0.00957	0.01915	1.18354	1.67658	0.01388	0.00957	0.01124	0.02697	2.45727	1.73627	2.47638	1.75283	0.02550	0.01929	0.75647
185	0.00117	0.03865	0.01932	0.82970	0.01698	0.03397	1.20526	1.89406	0.02604	0.01572	0.01964	0.05132	2.52352	1.77194	2.55918	1.73754	0.04583	0.03260	0.71125
186	0.01204	0.12383	0.06192	0.55368	0.04545	0.09091	1.80611	1.89670	0.08566	0.03730	0.06257	0.16825	1.70825	1.91843	1.75410	1.75793	0.16982	0.09030	0.53174
187	0.00183	0.04828	0.02414	0.57715	0.01772	0.03544	1.73264	3.03302	0.04101	0.01128	0.02583	0.08125	2.46237	1.75793	2.51332	1.81907	0.08134	0.02865	0.35229
188	0.00652	0.09115	0.04557	0.68671	0.03715	0.07430	1.45621	1.62302	0.05911	0.03492	0.04644	0.11422	1.15666	1.76557	1.17832	1.87639	0.11363	0.07311	0.64339
189	0.00254	0.05688	0.02844	0.82983	0.02529	0.05059	1.20507	1.47393	0.03544	0.02236	0.02871	0.06742	2.06365	1.84327	2.12607	1.82162	0.06624	0.04884	0.73731
190	0.01041	0.11514	0.05757	0.66215	0.04622	0.09245	1.51023	2.07228	0.08441	0.03461	0.05909	0.16354	1.86238	1.87385	2.01907	1.83181	0.15781	0.08400	0.53232
191	0.01193	0.12325	0.06162	0.62171	0.04797	0.09594	1.60847	1.49683	0.07844	0.04311	0.06156	0.14886	0.54139	1.85856	0.66495	1.93881	0.15099	0.10060	0.66630
192	0.00029	0.01928	0.00964	0.85489	0.00830	0.01660	1.16974	1.82759	0.01214	0.00831	0.00978	0.02427	2.35537	1.82544	2.37065	1.84200	0.02210	0.01683	0.76161
193	0.00351	0.06687	0.03343	0.69927	0.02733	0.05467	1.43006	1.67986	0.04432	0.02254	0.03410	0.08473	2.43689	1.91206	2.47766	1.83945	0.08323	0.05372	0.64543
194	0.00056	0.02666	0.01333	0.80981	0.01138	0.02276	1.23486	1.69889	0.01669	0.00931	0.01354	0.03296	2.26874	1.84073	2.29549	1.85729	0.03271	0.02173	0.66443
195	0.00069	0.02970	0.01485	0.78588	0.01254	0.02508	1.27246	1.86339	0.02031	0.01022	0.01525	0.03862	2.38849	1.87639	2.40759	1.84455	0.03884	0.02272	0.58493
196	0.00795	0.10061	0.05030	0.53920	0.03632	0.07264	1.85458	2.30703	0.07622	0.01720	0.05182	0.15026	0.89043	1.86875	1.92862	1.02673	0.16162	0.06263	0.38748
197	0.00067	0.02921	0.01461	0.57153	0.01042	0.02085	1.74970	2.50183	0.02188	0.00461	0.01473	0.04361	2.23690	1.88913	2.27129	1.86493	0.04556	0.01873	0.41110
198	0.01232	0.12525	0.06263	0.50725	0.04399	0.08798	1.97142	2.81529	0.11036	0.03472	0.06818	0.20726	1.02673	1.95283	1.23182	1.93372	0.19843	0.07906	0.39842
199	0.00334	0.06521	0.03260	0.39380	0.01985	0.03969	2.53935	2.34138	0.05173	0.00634	0.03267	0.09679	2.49804	1.90187	2.59103	1.92353	0.10902	0.03900	0.35779
200	0.00374	0.06904	0.03452	0.70542	0.02837	0.05675	1.41759	1.65430	0.04445	0.02131	0.03495	0.08690	1.25603	1.95283	1.29169	1.87512	0.08930	0.05338	0.59778
201	0.00042	0.02318	0.01159	0.84385	0.01003	0.02007	1.18504	1.68578	0.01472	0.00880	0.01178	0.02836	0.37451	1.92990	0.39744	1.94391	0.02826	0.01901	0.67241



## **Appendix 2-19 Field Measurements of Physical Properties**



Appendix2-19 Field Measurements of Physical Properties

No.	POINT No.	NORTH CORDINATION			EAST CORDINATION			MAGNETIC SUCEPTIBILITY ( $\times 10^{-3}$ S.I.U.)	FIELD ROCK NAME
		°	'	"	°	'	"		
1	G353	48	47	17	83	06	48	0.51	GRANITOID
2	G354	48	47	17	83	05	28	0.47	HORNFELS
3	G355	48	47	17	83	05	30	-	HORNFELS
4	G356	48	47	16	83	05	24	-	GRANITOID
5	G357	48	47	15	83	05	17	0.36	HORNFELS
6	G358	48	47	13	83	05	08	-	HORNFELS
7	G359	48	47	11	83	05	05	0.32	HORNFELS
8	G360	48	47	11	83	05	02	0.36	HORNFELS
9	G361	48	47	10	83	05	01	0.31	HORNFELS
10	G362	48	47	10	83	04	59	-	GRANITOID
11	G363A	48	47	08	83	04	55	0.15	HORNFELS
12	G363B	48	47	09	83	04	54	0.18	HORNFELS
13	G364	48	47	07	83	04	54	0.19	HORNFELS
14	G365	48	47	07	83	04	54	0.16	HORNFELS
15	G366	48	47	03	83	04	56	-	HORNFELS
16	G367	48	47	01	83	04	58	-	HORNFELS
17	G368	48	46	53	83	05	07	-	LAVA
18	G369	48	46	44	83	05	16	0.16	GRANITOID
19	G370	48	46	42	83	05	17	0.16	GRANITOID
20	G371	48	46	41	83	05	14	0.14	GRANITOID
21	G372	48	46	38	83	04	37	0.34	HORNFELS
22	G373	48	46	33	83	04	44	0.39	HORNFELS
23	G374	48	46	31	83	04	57	0.41	GRANITOID
24	G375	48	46	32	83	04	57	-	HORNFELS
25	G376	48	46	32	83	04	56	0.26	GRANITOID
26	G377	48	46	34	83	04	54	0.23	GRANITOID
27	G378	48	46	34	83	04	52	0.30	GRANITOID
28	G379	48	46	43	83	04	47	0.31	HORNFELS
29	G380	48	46	45	83	04	47	0.36	HORNFELS
30	G381	48	46	48	83	04	48	0.18	HORNFELS
31	G382	48	46	49	83	04	48	0.28	HORNFELS
32	G383	48	46	58	83	04	51	0.28	HORNFELS
33	G384	48	46	60	83	04	53	0.26	HORNFELS
34	G385	48	47	03	83	04	55	0.26	HORNFELS
35	G386	48	47	08	83	04	54	0.22	HORNFELS
36	G387	48	47	10	83	04	51	0.26	HORNFELS
37	G388	48	47	11	83	04	47	0.18	APLITE
38	G389	48	47	10	83	04	44	0.32	GRANITOID
39	G390	48	47	10	83	04	43	0.30	HORNFELS
40	G391	48	47	10	83	04	39	0.21	HORNFELS
41	G392	48	47	10	83	04	36	0.53	GRANITOID
42	G393	48	47	00	83	07	55	0.25	GRANITOID
43	G394	48	46	59	83	08	01	0.44	HORNFELS
44	G395	48	46	58	83	08	03	0.41	HORNFELS
45	G396	48	46	54	83	08	21	0.16	GRANITOID
46	G397	48	46	54	83	08	22	0.34	HORNFELS
47	G398	48	46	53	83	08	24	0.16	GRANITOID
48	G399	48	46	50	83	08	24	0.14	GRANITOID
49	G400	48	46	44	83	08	27	0.35	HORNFELS
50	G401	48	46	43	83	08	33	0.29	HORNFELS
51	G402	48	46	42	83	08	37	0.47	HORNFELS
52	G403	48	46	45	83	08	40	0.37	HORNFELS
53	G404	48	46	46	83	08	48	0.35	HORNFELS
54	G405	48	46	47	83	08	47	0.36	HORNFELS
55	G406	48	46	40	83	08	46	0.37	HORNFELS
56	G407	48	46	38	83	08	49	0.31	HORNFELS
57	G408	48	46	36	83	08	48	0.40	HORNFELS
58	G409	48	46	35	83	08	46	0.42	HORNFELS
59	G410	48	46	34	83	08	44	0.30	HORNFELS
60	G411	48	46	35	83	08	44	0.11	GRANITOID



Appendix2-19 Field Measurements of Physical Properties

No.	POINT No.	NORTH CORDINATION			EAST CORDINATION			MAGNETIC SUCCEPTIBILITY (X10 <sup>-3</sup> S.I.U.)	FIELD ROCK NAME
		"	'	''	"	'	''		
61	G412	48	46	36	83	08	44	0.13	GRANITOID
62	G413	48	46	36	83	08	46	0.18	GRANITOID
63	G414	48	46	36	83	08	43	0.09	GRANITOID
64	G415	48	46	36	83	08	41	0.34	HORNFELS
65	G416	48	46	33	83	08	39	0.06	GRANITOID
66	G417	48	46	27	83	08	38	0.52	HORNFELS
67	G418	48	46	42	83	08	42	0.34	HORNFELS
68	G419	48	46	26	83	08	49	0.46	HORNFELS
69	G420	48	46	25	83	08	51	0.38	HORNFELS
70	G421	48	46	21	83	08	56	0.33	HORNFELS
71	G422	48	47	14	83	04	42	0.15	GRANITOID
72	G423	48	48	24	82	54	47	0.38	GRANITOID
73	G424	48	48	14	82	54	06	0.18	GRANITOID
74	G425	48	45	06	83	01	47	0.33	HORNFELS
75	G426	48	45	07	83	01	37	0.11	GRANITOID
76	G427	48	45	08	83	01	32	0.26	HORNFELS
77	G428	48	45	09	83	01	26	0.39	HORNFELS
78	G429	48	45	08	83	01	25	0.69	GRANITOID
79	G430	48	45	06	83	01	25	0.10	GRANITOID
80	G431	48	45	04	83	01	22	0.11	GRANITOID
81	G432	48	45	03	83	01	28	0.27	GRANITOID
82	G433	48	45	05	83	01	32	0.95	GRANITOID
83	G434	48	45	03	83	01	36	0.17	GRANITOID
84	G435	48	45	03	83	01	39	0.16	GRANITOID
85	G436	48	45	01	83	01	41	0.16	GRANITOID
86	G437	48	44	55	83	01	39	0.11	GRANITOID
87	G438	48	44	54	83	01	34	0.11	GRANITOID
88	G439	48	44	54	83	01	27	0.25	HORNFELS
89	G440	48	44	52	83	01	23	0.30	HORNFELS
90	G441	48	44	42	83	01	44	0.34	HORNFELS
91	G442	48	44	51	83	01	48	0.12	GRANITOID
92	G443	48	45	22	83	02	51	0.29	HORNFELS
93	G444	48	45	12	83	02	46	0.31	HORNFELS
94	G445	48	46	41	83	03	51	33.80	HORNFELS
95	G446	48	46	40	83	03	49	48.59	HORNFELS
96	G447	48	46	36	83	03	43	44.43	HORNFELS
97	G448	48	46	37	83	03	34	5.84	HORNFELS
98	G449	48	46	12	83	02	18	0.09	GRANITOID
99	I153	48	47	16	83	05	44	0.33	GRANITOID
100	I154	48	47	16	83	05	44	0.32	HORNFELS
101	I155	48	47	14	83	06	02	0.34	HORNFELS
102	I156	48	47	14	83	06	07	0.13	GRANITOID
103	I157	48	47	14	83	06	12	0.25	GRANITOID
104	I158	48	47	12	83	06	12	0.28	HORNFELS
105	I159	48	47	08	83	06	08	0.32	HORNFELS
106	I160	48	47	07	83	06	07	0.14	GRANITOID
107	I161	48	47	06	83	06	06	0.15	HORNFELS
108	I162	48	47	01	83	06	04	0.17	GRANITOID
109	I163	48	46	59	83	06	02	0.19	HORNFELS
110	I164	48	46	59	83	06	04	0.16	HORNFELS
111	I165	48	46	55	83	06	12	0.18	HORNFELS
112	I166	48	46	54	83	06	39	0.30	HORNFELS
113	I167	48	46	55	83	06	45	0.38	HORNFELS
114	I168	48	46	58	83	06	50	0.17	HORNFELS
115	I169	48	47	03	83	06	50	0.14	GRANITOID
116	I170	48	47	07	83	06	48	0.24	HORNFELS
117	I171	48	47	10	83	06	46	0.17	GRANITOID
118	I172	48	47	12	83	06	45	0.26	HORNFELS
119	I173	48	47	15	83	06	46	0.23	GRANITOID
120	I174	48	47	17	83	06	48	0.23	HORNFELS



Appendix2-19 Field Measurements of Physical Properties

No.	POINT No.	NORTH CORDINATION			EAST CORDINATION			MAGNETIC SUCCEPTIBILITY ( $\times 10^{-3}$ S.I.U.)	FIELD ROCK NAME
		'	"	'''	'	"	'''		
121	I175	48	47	18	83	06	40	0.34	HORNFELS
122	I176	48	47	20	83	06	33	0.47	GRANITOID
123	I177	48	47	20	83	06	31	0.50	HORNFELS
124	I178	48	47	19	83	06	21	0.39	GRANITOID
125	I179	48	47	18	83	08	15	0.33	HORNFELS
126	I180	48	47	25	83	07	03	0.18	GRANITOID
127	I181	48	47	24	83	07	00	0.24	HORNFELS
128	I182	48	47	22	83	06	52	0.21	GRANITOID
129	I183	48	47	17	83	06	56	0.31	HORNFELS
130	I184	48	47	13	83	06	52	0.33	HORNFELS
131	I185	48	47	09	83	06	49	0.30	HORNFELS
132	I186	48	47	06	83	06	46	0.30	HORNFELS
133	I187	48	47	01	83	06	49	0.19	GRANITOID
134	I188	48	46	59	83	06	52	0.32	HORNFELS
135	I189	48	46	57	83	06	47	0.14	HORNFELS
136	I190	48	46	56	83	06	54	0.54	GRANITOID
137	I191	48	47	01	83	07	18	1.11	HORNFELS
138	I192	48	46	59	83	07	24	0.19	HORNFELS
139	I193	48	46	58	83	07	29	0.15	HORNFELS
140	I194	48	46	07	83	09	54	0.24	HORNFELS
141	I195	48	45	59	83	10	05	0.29	HORNFELS
142	I196	48	45	32	83	11	24	0.20	HORNFELS
143	I197	48	45	08	83	11	40	0.30	HORNFELS
144	I198	48	44	44	83	12	19	0.34	HORNFELS
145	I199	48	45	53	83	09	58	0.16	HORNFELS
146	I200	48	46	25	83	09	15	0.24	HORNFELS
147	I201	48	46	20	83	09	15	0.15	HORNFELS
148	I202	48	46	16	83	02	38	0.28	HORNFELS
149	I203	48	46	12	83	02	23	0.17	HORNFELS
150	I204	48	46	04	83	02	21	0.27	HORNFELS
151	I205	48	45	56	83	02	17	0.14	HORNFELS
152	I206	48	45	53	83	02	14	0.33	HORNFELS
153	I207	48	45	50	83	02	09	0.31	HORNFELS
154	I208	48	45	37	83	02	01	0.25	HORNFELS
155	I209	48	45	45	83	02	39	0.27	HORNFELS
156	I210	48	45	53	83	02	29	0.23	HORNFELS
157	I211	48	45	53	83	02	20	0.27	HORNFELS
158	I212	48	46	05	83	02	28	0.10	GRANITOID
159	I213	48	47	12	83	02	49	0.24	HORNFELS
160	I214	48	47	01	83	02	26	0.27	HORNFELS
161	I215	48	46	53	83	02	9	0.33	HORNFELS
162	I216	48	46	57	83	01	32	0.25	AGGLOMERATE
163	I217	48	46	11	83	01	29	0.25	LAVA
164	I218	48	46	13	83	01	26	0.23	LAVA
165	I219	48	46	13	83	01	23	0.18	LAVA
166	I220	48	46	10	83	01	19	0.38	LAVA
167	I221	48	43	30	82	59	52	0.35	AGGLOMERATE
168	I222	48	43	27	83	00	01	0.39	AGGLOMERATE
169	I223	48	43	24	83	00	12	0.55	AGGLOMERATE
170	I224	48	43	20	83	00	22	0.82	AGGLOMERATE
171	I225	48	43	17	83	00	33	0.43	AGGLOMERATE
172	I226	48	43	08	83	00	56	2.87	AGGLOMERATE
173	I227	48	43	04	83	01	07	0.27	AGGLOMERATE
174	I228	48	43	02	83	01	14	0.33	AGGLOMERATE
175	I229	48	43	00	83	01	17	0.29	AGGLOMERATE
176	I230	48	42	57	83	01	10	0.29	AGGLOMERATE
177	I231	48	43	21	83	02	57	0.34	GRANITOID
178	I232	48	42	26	83	03	10	0.19	GRANITOID



**Appendix 2-20 The Results of Opaque EDX Analysis**



Appendix 2-20 The Results of of Opaque EDX Analysis

ANALYZED POINT	Ti %	Fe %	Mn %	O %	Mg %	Si %	V %	Mineralogical name	Fe/Ti+Fe
G365	32.93	29.42	2.34	35.32				ALTERED ILMENITE	0.47
	32.66	30.21	1.80	35.33				ALTERED ILMENITE	0.48
	32.73	30.19	1.73	35.34				ALTERED ILMENITE	0.48
	59.95			40.05				ANATASE	0.00
Average									0.36
G370	31.70	31.10	2.06	35.14				ILMENITE	0.50
	31.28	30.66	3.09	34.97				ILMENITE	0.49
	32.11	30.69	1.98	35.22				ALTERED ILMENITE	0.49
	0.17	67.00	3.05	29.79				ANATASE	1.00
	0.07	67.09	3.07	29.77				ANATASE	1.00
Average									0.70
G378	32.35	30.32	2.08	23.66				Titaniferous magnetite	0.48
	32.58	30.15	1.98	25.34				Ilmenite	0.48
	32.00	30.77	2.03	24.63				Ilmenite	0.49
Average									0.48
G387	32.83	29.46	2.41	35.29				ALTERED ILMENITE	0.47
	32.85	29.25	2.62	35.28				ALTERED ILMENITE	0.47
	33.22	29.33	2.06	35.39				ALTERED ILMENITE	0.47
Average									0.47
G395	33.06	29.96	1.57	35.41				ALTERED ILMENITE	0.48
	32.38	30.88	1.42	35.32				ALTERED ILMENITE	0.49
	32.52	30.63	1.51	35.33				ALTERED ILMENITE	0.49
Average									0.48
G416	32.61	31.90		35.49				ALTERED ILMENITE	0.49
	32.75	29.49	2.49	35.27				ALTERED ILMENITE	0.47
	32.19	30.38	2.23	35.20				ALTERED ILMENITE	0.49
Average									0.48
G423	32.67	29.92	2.12	35.30				ALTERED ILMENITE	0.48
	32.02	30.53	2.28	35.17				ALTERED ILMENITE	0.49
	0.00	69.94		30.06				ANATASE	1.00
	32.11	30.64	2.04	35.21				ALTERED ILMENITE	0.49
Average									0.61
G433	2.54	66.98		30.48				ANATASE	0.96
	2.11	67.49		30.41				ANATASE	0.97
	32.31	32.25		35.44				ALTERED ILMENITE	0.50
	5.97	62.98		31.05				TITANIFEROUS MAGNETITE	0.91
	31.62	30.54	2.77	35.06				ILMENITE	0.49
	31.98	29.79	3.14	35.08				ALTERED ILMENITE	0.48
	1.19	68.56		30.25				ANATASE	0.98
Average									0.76
G442	39.57	22.42	1.49	36.51				PSEUDORUTILE	0.36
	39.99	22.18	1.23	36.60				PSEUDORUTILE	0.36
	39.69	22.63	1.12	36.56				PSEUDORUTILE	0.36
	38.78	23.22	1.64	36.36				PSEUDORUTILE	0.37
	40.10	21.41	1.94	36.55				PSEUDORUTILE	0.35
Average									0.36
G445	0.09	69.84		30.07				MAGNETITE	1.00
	38.22	20.67	5.19	35.92				PSEUDORUTILE	0.35
		69.94		30.06				MAGNETITE	1.00
		69.94		30.06				MAGNETITE	1.00
	36.65	22.80	4.85	35.69				PSEUDORUTILE	0.38
	37.54	23.18	3.29	35.99				PSEUDORUTILE	0.38
Average									0.69
G449	30.43	30.45	4.41	34.70				ILMENITE	0.50
	30.37	30.19	4.79	34.65				ILMENITE	0.50
Average									0.50
G450	30.70	31.39	3.04	34.88				ILMENITE	0.51
	30.96	31.44	2.63	34.96				ILMENITE	0.50
	30.94	31.30	2.83	34.94				ILMENITE	0.50
	31.03	30.62	3.45	34.89				ILMENITE	0.50
Average									0.50
I162	29.86	33.19	2.12	34.83				ILMENITE	0.53
	31.15	31.92	1.86	35.07				ILMENITE	0.51
	30.71	32.82	1.42	35.04				ILMENITE	0.52
Average									0.52
I173	30.89	31.84	2.29	34.98				ILMENITE	0.51
	30.76	31.72	2.59	34.93				ILMENITE	0.51
	0.61	69.23		30.16				MAGNETITE	0.99
	30.55	32.18	2.35	34.92				ILMENITE	0.51
Average									0.63



Appendix 2-20 The Results of of Opaque EDX Analysis

ANALYZED POINT	Ti %	Fe %	Mn %	O %	Mg %	Si %	V %	Mineralogical name	Fe/Ti+Fe
I178	30.20	30.72	4.41	34.66				ILMENITE	0.50
	30.25	31.05	3.98	34.71				ILMENITE	0.51
		69.94		30.06				MAGNETITE	1.00
		68.82		30.43				MAGNETITE	1.00
	30.42	32.49	2.17	34.92				ILMENITE	0.52
Average									0.71
I190	30.36	31.83	2.99	34.83				ILMENITE	0.51
	30.32	32.11	2.73	34.85				ILMENITE	0.51
	30.87	30.53	3.77	34.84				ILMENITE	0.50
	0.11	67.32	2.77	29.81				MAGNETITE	1.00
	0.28	67.43	2.41	29.87				MAGNETITE	1.00
Average									0.70
I212	31.75	31.60	1.44	35.21				ILMENITE	0.50
	56.74	3.74	0.00	39.51				ANATASE	0.06
	35.01	27.56	1.70	35.73				ALTERED ILMENITE	0.44
	32.62	30.09	1.98	35.30				ALTERED ILMENITE	0.48
	58.05	1.74	0.00	39.89				ANATASE	0.03
	31.66	31.44	1.73	35.17				ILMENITE	0.50
Average									0.33
I232	59.92	0.03		40.04				ANATASE	0.00
	31.94	26.81	3.30	34.63				ALTERED MANGANOFEROUS ILMENITE	0.46
	38.65	23.86	1.10	36.39				PSEUDORUTILE	0.38
	32.98	28.67	3.10	35.25				ALTERED ILMENITE	0.47
	30.56	27.58	3.23	34.27				MANGANOFEROUS ILMENITE	0.47
	40.38	21.90	1.03	36.69				PSEUDORUTILE/LEUCOXENE	0.35
Average									0.35
MJBKE-6 19.7m	32.28	28.63	4.04	35.04				ALTERED ILMENITE	0.47
	30.80	31.25	3.07	34.89				ILMENITE	0.50
Average									0.49
MJBKE-16 26.4m	32.09	29.65	3.17	35.10				ALTERED ILMENITE	0.48
	29.26	34.02	1.99	34.74				ILMENITE	0.54
	30.70	31.74	2.64	34.92				ILMENITE	0.51
	37.05	24.80	2.12	36.03				PSEUDORUTILE	0.40
	34.15	28.28	2.01	35.55				PSEUDORUTILE	0.45
	32.29	29.55	3.02	35.15				ALTERED ILMENITE	0.48
Average									0.49
MJBKE-25 23.7m	30.95	30.28	3.94	34.83				ILMENITE	0.49
	31.68	30.61	2.64	35.08				ILMENITE	0.49
	32.11	29.25	3.59	35.06				ALTERED ILMENITE	0.48
Average									0.49
MJBKE-25 24.5m	29.52	30.43	5.62	34.43				ILMENITE	0.51
	31.20	29.06	4.96	34.78				ILMENITE	0.48
	34.04	27.05	3.52	35.39				ALTERED ILMENITE	0.44
	33.94	8.91	23.73	33.41				ALTERED ILMENITE	0.21
	29.76	25.57	10.68	33.98				ILMENITE	0.46
	35.49	25.40	3.48	35.63				PSEUDORUTILE	0.42
Average									0.42
MJBKE-29 14.1m	33.19	18.43	14.16	34.22				ALTERED ILMENITE	0.36
	35.17	25.80	3.45	35.58				ALTERED ILMENITE	0.42
	33.73	22.91	8.51	34.85				ALTERED ILMENITE	0.40
	35.44	26.39	2.44	35.73				ALTERED ILMENITE	0.43
	33.40	22.63	9.25	34.73				ALTERED ILMENITE	0.40
	36.37	25.65	2.07	35.92				PSEUDORUTILE	0.41
	33.29	27.36	4.14	35.20				ALTERED ILMENITE	0.45
	31.92	22.87	10.89	34.32				ALTERED ILMENITE	0.42
Average									0.41
MJBKE-33 12.7m	34.39	28.48	1.48	35.65				ALTERED ILMENITE	0.45
	33.92	27.43	3.26	35.39				ALTERED ILMENITE	0.45
Average									0.45
MJBKE-33 13.3m	37.22	24.54	1.26	36.25				PSEUDORUTILE	0.40
	29.31	30.76	5.52	34.41				ILMENITE	0.51
	32.58	12.16	21.90	33.37				ALTERED ILMENITE	0.27
	34.89	26.55	2.97	35.58				ALTERED ILMENITE	0.43
	36.82	25.21	1.97	36.00				PSEUDORUTILE	0.41
	34.57	28.17	1.60	35.66				ALTERED ILMENITE	0.45
Average	9.36	59.02		31.62				TITANIFEROUS MAGNETITE	0.86
Average									0.48



Appendix 2-20 The Results of of Opaque EDX Analysis

ANALYZED POINT	Ti %	Fe %	Mn %	O %	Mg %	Si %	V %	Mineralogical name	Fe/Ti+Fe
MJBKE-36 17.8m	33.91	28.23	1.35	35.71				PSEUDORUTILE	0.45
	30.64	32.80	1.55	35.01				ILMENITE	0.52
	32.19	29.63	3.06	35.12				PSEUDORUTILE	0.48
	34.89	25.39	4.26	35.46				PSEUDORUTILE	0.42
	59.66	0.34		40.00				ANATASE/RUTILE	0.01
Average									0.38
MJBKE-38 54.7m	6.47	62.39		31.14					0.91
	32.04	26.81	6.37	34.78				ILMENITE	0.46
	28.43	34.49	2.53	34.55				ILMENITE	0.55
Average									0.64
MJBKE-39 13.5m	36.74	25.12	2.18	35.97				PSEUDORUTILE	0.41
	37.44	24.72	1.71	36.13				PSEUDORUTILE	0.40
	36.85	24.94	2.23	35.98				PSEUDORUTILE	0.40
Average									0.40
MJBK-44 Conc	33.23	29.25	2.13	35.39				ALTERED ILMENITE	0.47
	33.49	29.40	1.62	35.48				ALTERED ILMENITE	0.47
Average									0.47
MJBK-54 54.7m	34.53	28.57	1.21	35.69				ALTERED ILMENITE	0.45
	30.85	23.02	12.11	34.03				ILMENITE	0.43
	29.76	32.08	1.14	35.20				ILMENITE	0.52
	31.50	30.59	2.88	35.03				ILMENITE	0.49
Average									0.47
MJBK-54 56.5m	30.18	32.98	1.95	34.90				ILMENITE	0.52
	37.01	25.69	1.19	36.11				PSEUDORUTILE	0.41
Average									0.47
MJBK-54 57.5m	59.95			40.05				ANATASE	0.00
	29.86	33.84	1.40	34.90				ILMENITE	0.53
	36.49	25.96	1.56	35.99				PSEUDORUTILE	0.42
	30.75	32.25	2.01	34.99				ILMENITE	0.51
	29.80	33.21	2.18	34.81				ILMENITE	0.53
	32.77	29.66	2.27	35.30				ALTERED ILMENITE	0.48
Average									0.41
Karaotkel Pit2	1.21	68.54	0.00	60.16				MAGNETITE	0.98
	37.18	24.89	1.85	36.07				PSEUDORUTILE	0.40
	28.61	32.52	4.47	34.39				ILMENITE	0.53
	0.89	66.35	2.83	29.93				MAGNETITE	0.99
Average									0.73
Karaotkel Conc	35.54	26.36	2.34	35.75				PSEUDORUTILE	0.43
	36.27	24.61	3.35	35.78				PSEUDORUTILE	0.40
	34.14	27.15	3.28	35.43				ALTERED ILMENITE	0.44
	38.60	21.77	3.48	36.15				PSEUDORUTILE	0.36
	36.64	25.75	1.60	36.01				PSEUDORUTILE	0.41
	36.13	25.56	2.47	35.84				PSEUDORUTILE	0.41
	0.84	66.22	2.31	30.13				MAGNETITE	0.99
	1.89	65.17	2.84	30.10				MAGNETITE	0.97
	1.11	68.65		30.24				MAGNETITE	0.98
	34.93	25.62	3.95	35.50				ALTERED ILMENITE	0.42
Average									0.58



## **Appendix 2-21 Determination of Zircon Radioactivity**



## Appendix 2-21 Determination of Zircon Radioactivity

No.	Hole No.	Depth (m)	Alpha integral		Beta integral	
			Becquerel/kg	±	Becquerel/kg	±
1	MJBK-52	44.8 - 46.4	603	220	640	120
2	MJBK-50	38.5 - 42.0	359	217	500	100
3	MJBK-50	49.0 - 52.0	576	202	340	130
4	MJBK-50	54.6 - 57.2	581	201	350	120
5	MJBK-49	39.5 - 41.6	434	165	460	110
6	MJBK-49	48.0 - 52.4	670	223	540	140
7	MJBK-48	48.6 - 49.5	671	223	520	140
8	MJBK-54	54.3 - 57.6	496	191	470	120
9	MJBK-44	48.3 - 51.6	574	237	350	130
10	MJBK-43	41.0 - 43.7	586	203	360	150
11	MJBK-53	56.0 - 57.1	351	225	520	110
12	MJBK-38	60.0 - 62.0	797	214	630	120
13	MJBK-40	46.0 - 48.0	416	179	450	120
14	MJBKS-29	32.0 - 34.2	626	224	560	130
15	MJBKS-31	33.5 - 35.5	917	290	590	140
16	MJBKE-35	9.3 - 13.7	575	213	350	110



### **Appendix 3. Miscellaneous Data for the Drilling Survey**



## **Appendix 3-1 List of the Used Equipment for Drilling**



## Appendix 3-1 List of the Used Equipment for Drilling (1)

No.1 machine

Item	Model, type and specification	Quantity	Note
Drilling machine	UGB-3UK,	1	percussion
Motor for Drilling machine	22kw	1	
Generator	60KVA	1	
Tank for water	3m <sup>3</sup>	1	
Tank for fuel	1m <sup>3</sup>	1	
Tanker for water	3m <sup>3</sup>	1	
Trailer house	6 passengers	1	
Casing pipes	12" L= 6.70m	6	
	10" L= 6.70m	10	
	8" L= 2.00m	25	
Bailer	φ 300mm L= 3.80m	1	
	φ 240mm L= 3.50m	1	
	φ 240mm L= 2.20m	1	ball valve
Sampler	φ 190mm L= 5.00m	1	
Hanmer with chain	W=1,000kg	1	used for driving casing pipes
Tripod derrick	H= 9.0m	1	used for recovering casing pipes
Implements		1	

## Appendix 3-1 List of the Used Equipment for Drilling (2)

No.2 machine

Item	Model, type and specification	Quantity	Note
Drilling machine	UGB-3UK,	1	percussion
Motor for Drilling machine	22kw	1	
Generator	40KVA, 400V, 52A	1	
Tank for water	3m <sup>3</sup>	1	
Tank for fuel	1.5m <sup>3</sup>	1	
Tanker for water	3m <sup>3</sup>	1	
Trailer house	6 passengers	1	
Casing pipes	12" L= 6.70m	4	
	10" L= 6.70m	10	
	8" L= 2.00m	30	
Bailer	φ 300mm L= 3.80m	1	
	φ 240mm L= 3.50m	1	
	φ 240mm L= 2.20m	1	ball valve
Sampler	φ 190mm L= 5.00m	1	
Hanmer with chain	W=1,000kg	1	used for driving casing pipes
Tripod derrick	H= 9.0m	1	used for recovering casing pipes
Implements		1	



## Appendix 3-1 List of the Used Equipment for Drilling (3)

No.3 machine

Item	Model, type and specification	Quantity	Note
Drilling machine	UGB-2A-2	1	rotary
Motor for Drilling machine	MJBOK-13, 131HP	1	
Drilling Pump	MB-50, 50m <sup>3</sup> /h	1	
Pump for water	100L/min	1	
Generator	3KVA	1	
Tank for water	2m <sup>3</sup>	1	
Tank for fuel	1m <sup>3</sup>	1	
Tanker for water	3m <sup>3</sup>	1	
Tractor		1	
Truck	4t, 10t	2	
Bus		1	
Rods	φ 50mm L= 6.70m	30	
Casing pipes	φ 127mm L= 3.00m	5	
	φ 144mm L= 4.50m	20	
	φ 98mm L= 1.50m	5	
Core tube assembly	φ 127mm L= 1.50m	4	
	φ 89mm L= 3.00m	4	
Implements		1	