Appendices

Apx. 1 Results of microscopic observation of thin sections

Results of microscopic observation on thin sections

	No.	Sample No.	Rock Name	Qz	Cal	Fl	Ba	Ap	Dol	Bas	Syn	RE	K-f	Phr	Leu	Rtl	Ol	Sp	Py	Ga	Op	Remarks
Rock Samples	1	0115-N02	Marble	+	◎	+	+	+													+	
	2	0115-U05	Weathered quartz syenite	○	○								◎									
	3	0115-U12	Weathered syenite	△	○	○	+						◎								○	
	4	0101-U01	Marble	+	◎	○	+														+	
	5	0101-U02	Weathered Calc-silicate rock	◎	○																	
	6	0101-U03	Altered volcanic breccia	◎	△	+															+	
	7	0101-U04	Marble		◎	△															+	
	8	0104-U05	Silicified rock	◎																	○	
	9	0108-U01	Marble		◎																+	
	10	0112-U05	Quartzite	◎	+																	
	11	0115-N01	Marble	△	◎	+																
	12	0115-U01	Marble	◎	◎																	
	13	0115-U02	Weathered Calc-silicate rock	◎	△	△		+				+	◎									
	14	0115-U03	Marble	△	◎	+		△														
	15	0116-U01	Altered volcanic breccia	○	○														+?		+	
	16	1219-U03	Marble	+	◎	+															+	
	17	1222-U07	Marble	+	◎														+			
	18	1219-N02	Marble	+	◎	+																
	19	1223-N03	Calcarious limestone	+	◎																	
	20	H-01	Altered alkali volcanic breccia	◎	△								◎			+					+	
Ore Samples	1	0104-U03	Barite, Fluorite and REE ore	◎	△	○	○	+		+											△	
	2	1223-U08	Fluorite and REE ore	◎		◎	△					○										
	3	0107-U01	Silicified rock	◎										○				+			△	
	4	0112-U02	Silicified rock	◎			△									+					○	
	5	0112-U04	Fluorite and opaque minerals	△		◎	○					+				+					◎	
	6	1219-U04	Barite ore		◎		◎														+	
	7	MJVD-10-41.10	Marble		◎																+	
	8	MJVD-10-77.95	Barite and Fluorite ore		◎	◎	◎	+		+		+									+	
	9	MJVD-10-96.40	Barite and Fluorite ore	+	◎					+		+?									+	
	10	MJVD-11-57.40	Marble	+	◎																+	
	11	MJVD-11-70.40	Marble	△	◎	+	+	+											+?		+	
	12	MJVD-1-25.30	Marble	△	◎	+	△									+					+	
	13	MJVD-1-47.05	Weathered barite ore	△	◎		○															
	14	MJVD-1-73.50	Barite ore		◎	+	◎					+?									+	
	15	MJVD-4-87.85	Barite and fluorite ore		◎	◎	◎	+		+?								+	+		+	
	16	MJVD-5-45.75	Minnet?					+						◎	◎		+					Ol: Pseudomorph
	17	MJVD-5-91.70	Barite and fluorite ore		◎	△	△			+												
	18	MJVD-8-53.70	Barite and REE ore	◎			◎			△	△?										△	
	19	P1b-03	Barite and fluorite ore		○	◎	◎	+		+?	+?										+	
	20	P3-550	Barite and REE ore	◎			◎			+											+	
Core Samples	1	MJVD-1-78.1	Marble	+	◎	+	△														◎	
	2	MJVD-1-12.6	Silicified limestone	◎	○		△	△										+		+	+	
	3	MJVD-5-34.1	Fluorite and barite ore		◎	◎	◎			+?											+	
	4	MJVD-5-94.5	Fluorite and barite ore		◎	◎	◎	+		+?											+	
	5	MJVD-7-20.95	Fluorite and barite ore	○	◎	◎	○	△		+?											+	
	6	MJVD-7-36.7	Marble		◎		+	△	△												+	
	7	MJVD-8-81.1	Marble	△	◎	△	+														+	
	8	MJVD-10-73.9	Fluorite, barite ore, with syenit	+	◎	◎	○			△?	+?											
	9	MJVD-14-79.6	Marble	+	◎	△	+	+	+	+						+					+	
	10	MJVD-16-99.5	Marble	△	◎	○	△	△	+												+	

◎, ≧30 %; ○, 10 - 30 %; △, 5 - 10 %; +, <5 %.

Cal : Calcite
Qz : Quartz
Fl : Fluorite
Ba : Barite
Ap : Apatite
Dol : Dolomite
Bas : Bastnaesite
Syn : Synchysite
RE : REE mineral
K-f : K-feldspar
Phr : Phrogopite
Leu : Leucite
Rtl : Rutile
Ol : Olivine
Sp : Sphalerite
Py : Pyrite
Ga : Galena
Op : Opaque mineral

Description of microscopic observation on thin sections

0115-N02 : Marble

The sample is coarse marble, containing calcite (95%), fluorite (<3%), apatite (<1%), quartz (<1%) and opaque mineral (<1%). Calcite is characterized by saccaroidal texture. Calcite crystal with the size of 0.05-0.5mm.

0115-U05 : Weathered quartz syenite

The sample is weathered and altered quartz syenite. The major rock-forming minerals are K-feldspar(>70%), quartz(20%), carbonate(calcite) (5%), and opaque mineral (ion oxide) (5%). K-feldspar crystal with the size of 0.1-1.2mm.

0115-U12 : Weathered syenite

The sample is strongly weathered and altered syenite. The major rock-forming minerals are K-feldspar (>60%), quartz(20%), carbonate(calcite) (5%), barite(<5%), fluorite(<5%), and opaque mineral (ion oxide) (5%). This rock shows blastoporphyritic texture.

0101-U01 : Marble

The sample is fine to medium marble, containing calcite(>80%), fluorite(10%), barite (<5%), quartz (<1%) and opaque mineral (<1%). Calcite crystal with the size of 0.05-0.5mm.

0101-U02 : Weathered Calc-silicate rock

The sample is strongly weathered calc-silicate rock. The major rock-forming minerals are quartz(5%), K-feldspar (30%), calcite (<10%), and opaque mineral (5%). Colored mineral may change to carbonate.

0101-U03 : Altered volcanic breccia

The sample is altered volcanic breccia. The major rock-forming minerals are K-feldspar (>50%), Quartz (>25%), Calcite (20%), and opaque mineral (5%). Colored mineral may change to carbonate.

0101-U04 : Marble

The sample is fine marble, containing calcite (95%) and fluorite (<5%). Calcite crystal with the size of 0.05-0.3mm.

0104-U05 : Silicified rock

The sample is silicified rock, containing quartz (90%), acicular shaped carbonate mineral(apatite) (<1%), and opaque mineral (<10%). Quartz is unhederal and very fine grained.

0108-U01 : Marble

The sample is fine marble, containing calcite(99%) and opaque mineral (<1%). Calcite is characterized by saccaroidal texture. Calcite crystal with the size of 0.05-0.5mm.

0112-U05 : Quartzite

The sample is medium quartzite, containing quartz (>95%) and carbonate mineral (<5%). Quartz crystal with the size of 0.05-0.3mm. Carbonate is observed between quartz grains..

0115-N01 : Marble

The sample is fine marble, containing calcite (95%), quartz (<3%), fluorite <1%) and opaque mineral(<1%). Calcite is characterized by saccaroidal texture, conspicuous lamellae and cleavage. Calcite crystal with the size of 0.05-0.5mm.

0115-U01 : Marble

The sample is medium to course marble with quartz block. The major rock-forming minerals are calcite (70%) and quartz (30%). The boundary of each mineral shows stured structure. Calcite crystal with the size of 0.05-0.5mm. Quartz crystal is observed unhedral shape with the size of 0.1-3mm.

0115-U02 : Weathered Calc-silicate rock

The sample is calc-silicate rock. The major rock-forming minerals are quartz(>65%), REE mineral (>5%), calcite (5%), apatite (<5%), fluorite (<5%) and opaque mineral (5%).

0115-U03 : Marble

The sample is medium marble, containing calcite (>90%), quartz (<5%), and apatite (<3%). Calcite is characterized by saccaroidal texture, conspicuous lamellae and cleavage.

0116-U01 : Altered volcanic breccia

The sample is altered volcanic breccia consist of K-feldspar (>40%), calcite (>25%), Qz

(20%), and opaque mineral (10%). Colored mineral may change to carbonate.

1219-U03 : Marble

The sample is fine to medium marble, containing calcite(95%), fluorite (<1%), barite (<1%) and quartz (<1%). Calcite is characterized by saccaroidal texture, conspicuous lamellae and cleavage. Calcite crystal with the size of 0.05-0.5mm. Fluorite is observed as a veinlet with the size of 0.15mm.

1222-U07 : Marble

The sample is fine to medium marble, containing calcite (95%), quartz (<3%), and opaque mineral (<1%). Calcite is characterized by saccaroidal texture, conspicuous lamellae and cleavage. Calcite crystal with the size of 0.05-0.5mm.

1219-N02 : Marble

The sample is fine to medium marble, containing calcite (95%), quartz (<3%), and fluorite (<1%). Calcite crystal with the size of 0.05-0.5mm. Quartz has subhedral to unhedral shape (0.1-0.3mm).

1223-N03 : Calcareous limestone

The sample is calcareous very fine limestone, accompanied calcite vein. The main minerals of this sample are calcite (>95%) and quartz (<5%). There are a lot of limestone block consist of very fine calcite (<0.01mm).

H-01 : Altered volcanic breccia

The sample is altered volcanic breccia consist of K-feldspar (>40%), Qz (>30%), calcite (10%), rutile (<1%), and opaque mineral (10%).

0104-U03 : Barite, Fluorite and REE ore

The sample consist of fluorite (>40%), barite (>30%), quartz (>10%), calcite (5%), bastnaesite (<5%), and opaque mineral (<10%). Quartz is fine (0.05-0.1mm) and mosaic texture. Fluorite crystal with the size of 0.05-1mm. Carbonate crystal is very fine grained (<0.1 mm) in the matrix.

1223-U08 : Fluorite and REE ore

The sample is fluorite and REE ore. The sample consist of fluorite (>40%), quartz (>30%), REE minerals (<10%), barite (<5%). Fluorite crystal with the size of 0.05-0.1mm.

REE minerals are very fine grained (<0.01mm).

0107-U01 : Silicified rock

The sample consist of quartz (>70%) and phrogopite (>20%) and opaque mineral (<10%). Quartz is characterized by anhedral and mosaic texture. Phrogopite is characterized by lath like shape .Phrogopite crystal with the size of 0.05-0.4mm.

0112-U02 : Silicified rock

The sample consist of subhedral and aggregated quartz (>60%), opaque mineral (35%), barite (<3%), and rutile (<1%). It is assumed that this original rock is sandstone by blasotpsamitic texture.

0112-U04 : Fluorite and opaque minerals

The sample consist of fluorite (30%), opaque mineral (25%), barite (20%), quartz (10%), and carbonate (10%). Fluorite crystal with the size of 0.1-0.5mm. Barite with the size of <0.05-1.5mm.

1219-U04 : Barite ore

The sample consist of barite and calcite(marble) block. The size of calcite is larger near the barite block (0.02-2mm).

MJVD-10-41.10 : Marble

The sample is medium marble, containing calcite(>99%) and opaque mineral(<1%). Calcite is characterized by saccaroidal texture, conspicuous lamellae and cleavage.

MJVD-10-77.95 29 : Barite and Fluorite ore

The sample is barite and fluorite ore, containing barite(30%), fluorite(30%), calcite(30%), apatite (<5%), and REE (<5%). Barite and fluorite has calcite veinlets(0.02-.0.05mm) with REE mineral (bastnaesite).

MJVD-10-96.40 : Barite and Fluorite ore

The sample is barite and fluorite ore, containing barite(35%), fluorite(30%), calcite(25%), apatite (5%), and REE (<5%). Barite and fluorite has calcite veinlets(0.02-.0.05mm) with REE mineral (bastnaesite). Calcite is characterized by decussate texture and accompanied by iron oxides.

MJVD-11-57.40 : Marble

The sample is medium marble, containing calcite (99%) and quartz (<1%). Calcite is characterized by saccaroidal texture, conspicuous lamellae and cleavage. Calcite crystal with the size of 0.05-0.5mm. Quartz is observed in the small calcite veinlet with the size of 0.15mm.

MJVD-11-70.40 : Marble

The sample is fine to medium marble, containing calcite (90%), quartz (<3%), barite (<2%), apatite (<2%) and fluorite (<1%). Calcite is characterized by conspicuous lamellae and cleavage. Calcite crystal with the size of 0.05-1.5mm.

MJVD-1-25.30 : Marble

The sample is fine marble with calcite and quartz veinlets. Calcite is observed as saccaroidal texture. Calcite crystal with the size of 0.02-4mm.

MJVD-1-47.05 : Weathered rock with calcite veinlets

The sample is a weathered very fine grained rock (syenite?) consist of quartz (50%), calcite (25%), iron oxide (20%) and barite (<5%) and calcite (0.1-2mm) veinlets.

MJVD-1-73.50 : Barite ore

The sample consist of calcite (60%) and barite (35%). Calcite goes into barite block as a network and includes barite.

MJVD-4-87.85 : Barite and fluorite ore

The main minerals in this rock is calcite (>40%), barite (>30%), fluorite (>20%). There are many opaque minerals (sphalerite and pyrite). Barite and fluorite grains are coarse (>1-2mm). Calcite grain is fine to course (max 5mm). Medium grained calcite is characterized by decussate texture and course grained is characterized by cleavage and lamella. It is assumed that the fine carbonate include the REE minerals by assay result.

MJVD-5-45.75 : Minnet?

The sample has phenocrist of phrogopite, micro phenocrist of apatite and matrix of zeolite or leucite. Olivine is identified as pseudomorph.

MJVD-5-91.70 : Barite and fluorite ore

The main minerals in this rock is calcite (>50%), barite (>20%), fluorite (>20%), and

REE minerals. Barite and fluorite grains are coarse (>1-2mm). Calcite is characterized by fibrous shape and wavy extinction. It supposed that this rock is affected by volcanic activities.

MJVD-8-53.70 : Barite and REE ore

The main minerals in this rock is quartz, barite and REE (bastnaesite) minerals. This rock is weathered. Quartz has euhedral shape. Bastnaesite is transformed. It supposed that this rock is caused by hydrothermal mineralization.

P1b-03 : Barite and fluorite ore

The main minerals in this rock is barite (>40%), fluorite (>40%), calcite and REE minerals. Barite and fluorite grains are coarse (>1-2mm). But, calcite and REE? minerals are fine (<0.2mm).

P3-550 : Barite and REE ore

The main minerals in this rock is barite (>50%), Quartz (>40%), REE (bastnaesite (5%) and opaque mineral (<5%). Barite and quartz grains are coarse (max >10mm). Bastnaesite is observed in matrix with barite and small veinlet in quartz.

MJVD-1-78.1 : Marble

This is course to medium grained marble. This rock is consist of mainly calcite (>95%) and a little barite, fluorite, and quartz.

MJVD-1-12.6 : Silicified limestone

The main minerals in this rock are very fine grained quartz and calcite (quartz > 40%, calcite >30%). There are some opaque mineral (galena, sphalerite etc.), barite and apatite.

MJVD-5-34.1 : Fluorite and barite ore

This is fluorite and barite ore which is mainly consist of medium to coarse grained calcite, fluorite and barite. Calcite is characterized by fibrous shape and wavy extinction. It supposed that this rock is affected by volcanic activities.

MJVD-5-94.5 : Fluorite and barite ore

This is fluorite and barite ore which is mainly consist of medium to course grained calcite, fluorite and barite. Calcite is characterized by conspicuous lamellae and

cleavage.

MJVD-7-20.95 : Fluorite and barite ore

This is fluorite and barite ore which is mainly consist of medium to coarse grained calcite and fluorite with barite and quartz. Calcite is characterized by fibrous shape and wavy extinction. It supposed that this rock is affected by volcanic activities.

MJVD-7-36.7 : Marble

This rock is medium grained Marble. The main mineral is Calcite (> 90%) and dolomite, and apatite. Calcite is under 1mm. Calcite is characterized by conspicuous lamellae and cleavage.

MJVD-8-81.1 : Marble

This rock is fine grained Marble with calcite, fluorite and quartz veinlets. Calcite is fine grained (< 0.1mm) and has saccaloidal texture.

MJVD-10-73.9 : Fluorite, barite ore, with syenite fragments

This is REE ore which is consist of mainly fluorite, calcite, barite and REE minerals (bastnaesite and maybe synchycite). There are some syenite fragments. Some large euhedral fluorite contains the REE minerals.

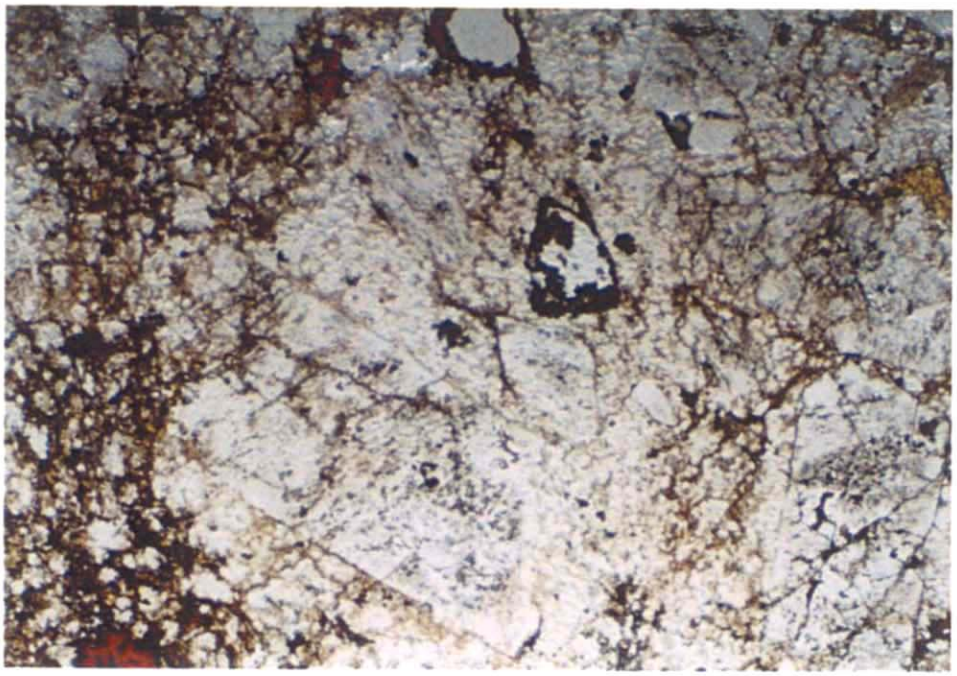
MJVD-14-79.6 : Marble

The main minerals in this rock are calcite, fluorite, quartz, and bastnaesite. This rock has very fine saccaroidal texture and medium grained calcite veinlets. There are bastnaesite (lathlike) near the quartz veinlet. Calcite (>90%).

MJVD-16-99.5 : Marble

The main minerals in this rock are calcite, quartz, apatite, barite, and fluorite. a little op mineral (pyrite and galena). saccaroidal texture of calcite (> 80%). Fluorite > 2mm.

Sample No. 0115-U12
Rock Name : Weathered Syenite
Location : 350745E, 2466651N



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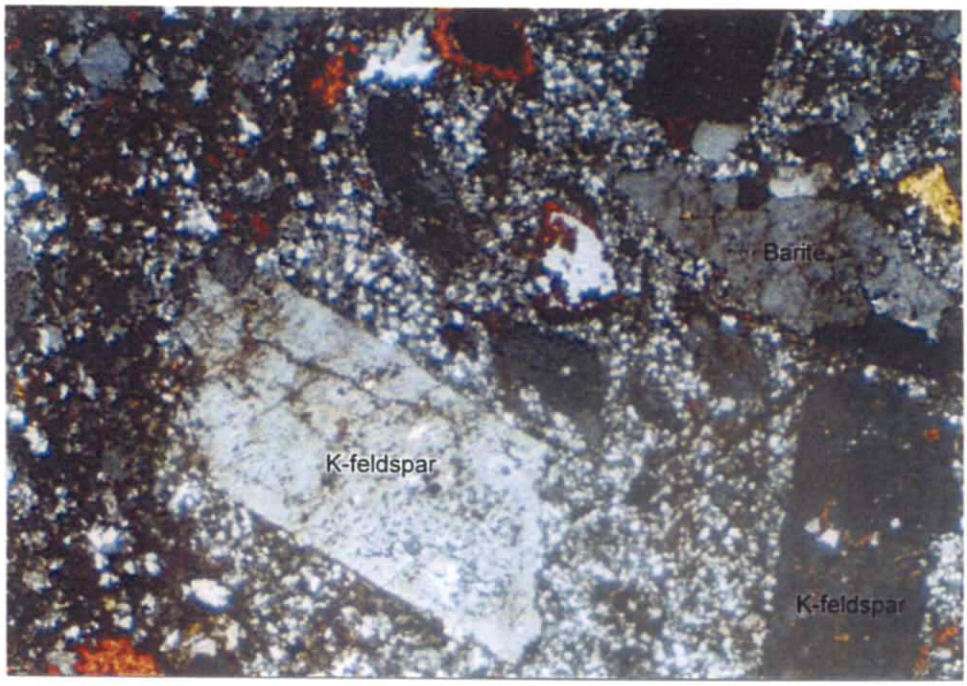
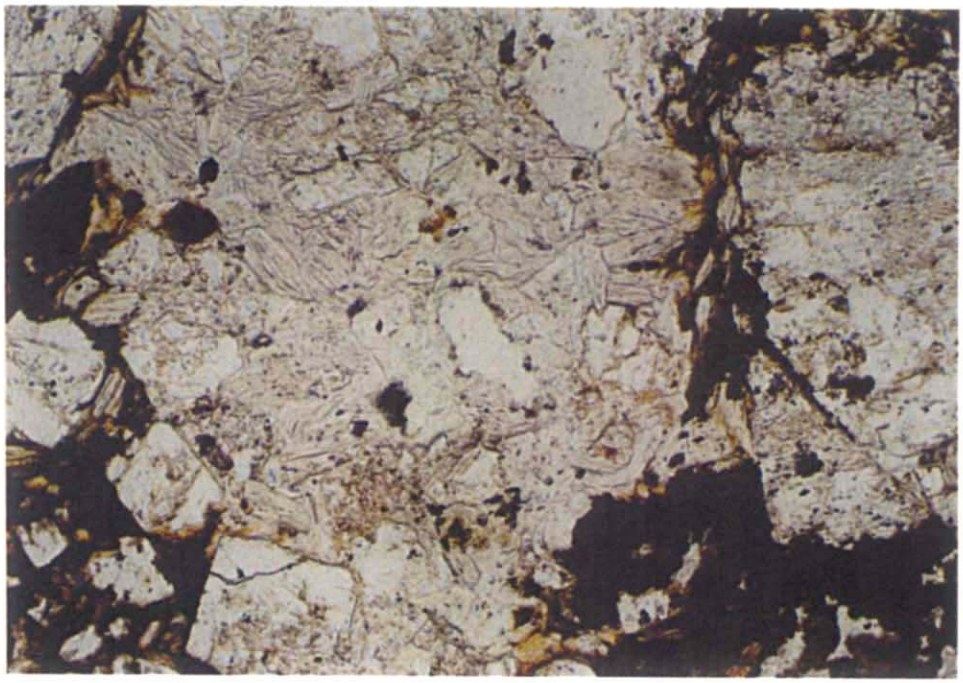


Crossed

1mm

Sample No. 0115-U02
Rock Name : Weathered Calc-silicate rock
Location : 351652E, 2466345N



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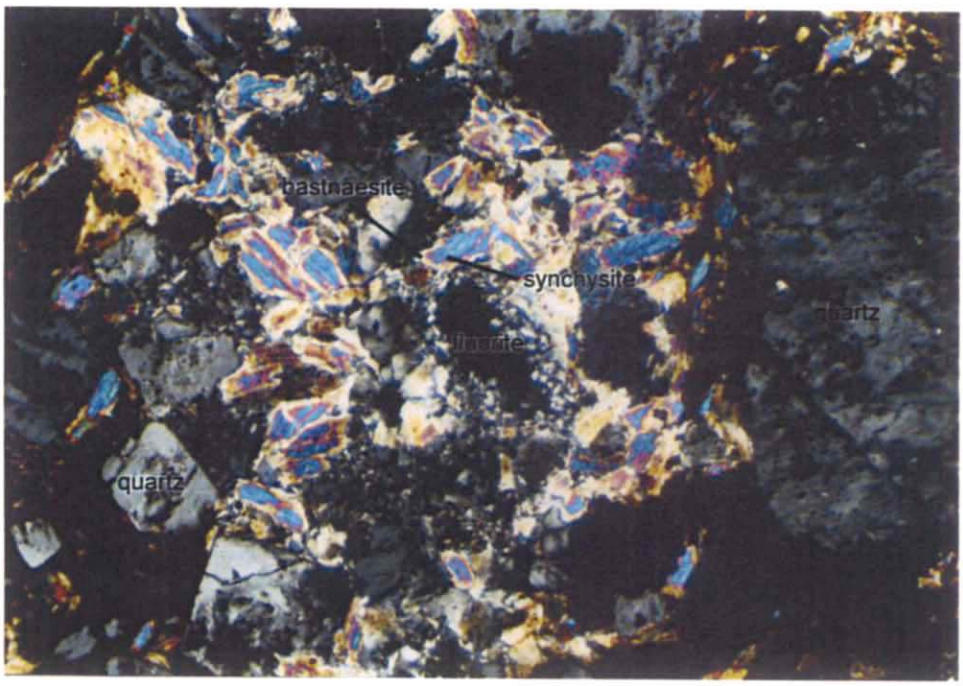
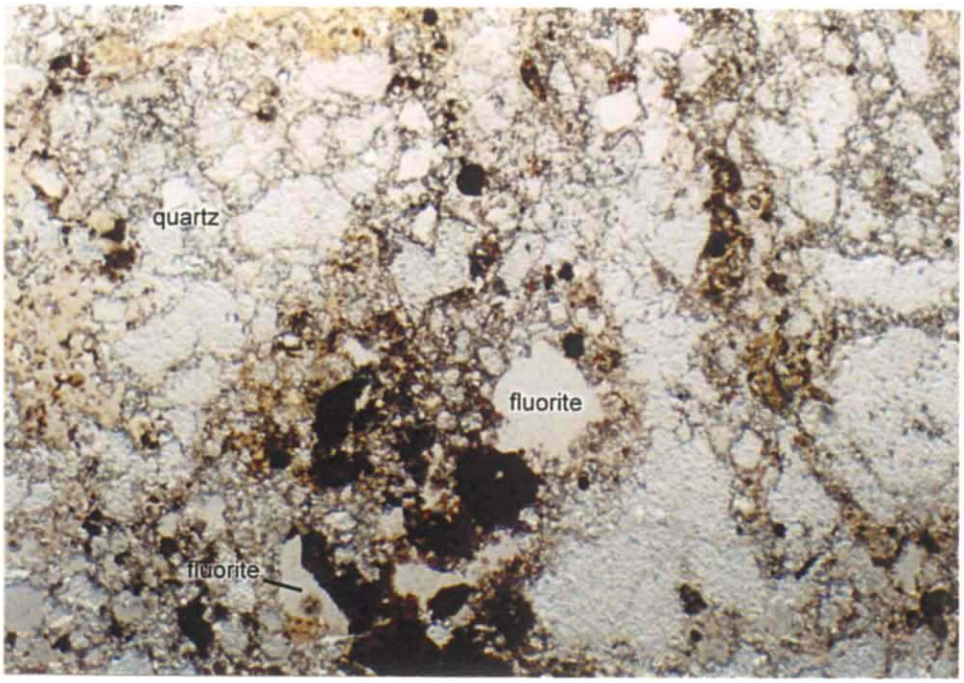


Crossed

0.5mm

Sample No. 0104-U03
Rock Name : Barite, Fluorite, and REE ore
Location : 351460E, 2468761N



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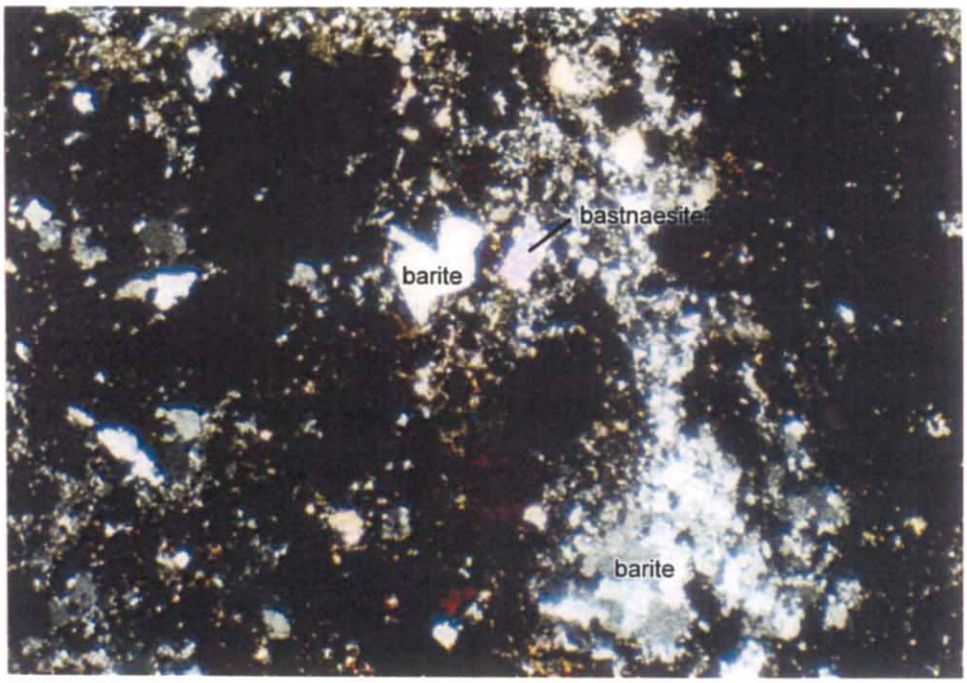
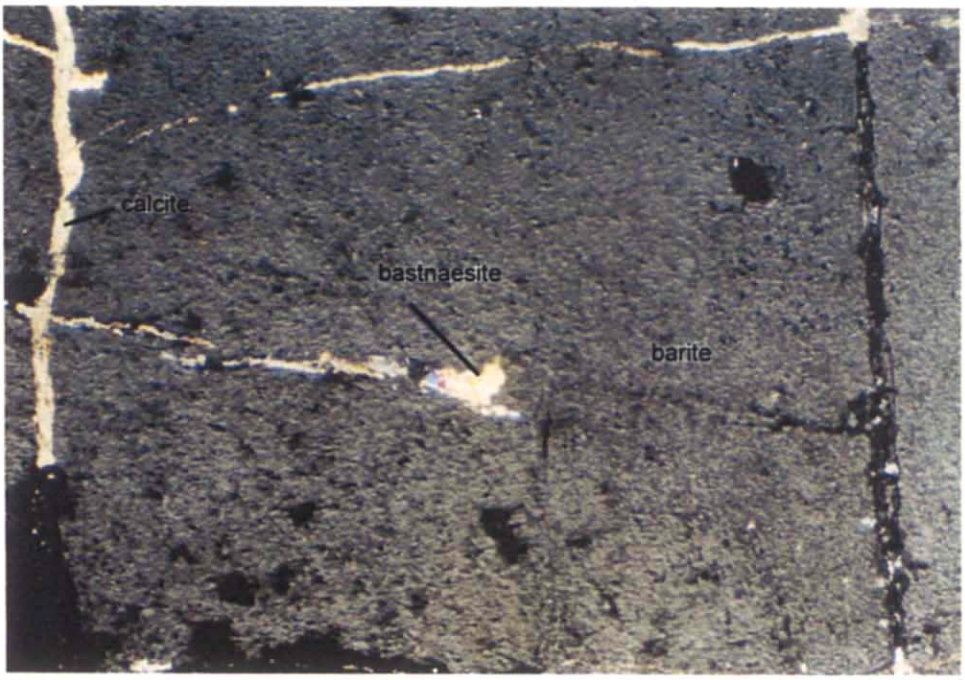


Crossed

1mm

Sample No. MJVD-10-96.40
Rock Name : Barite and Fluorite ore
Location : Drilling core

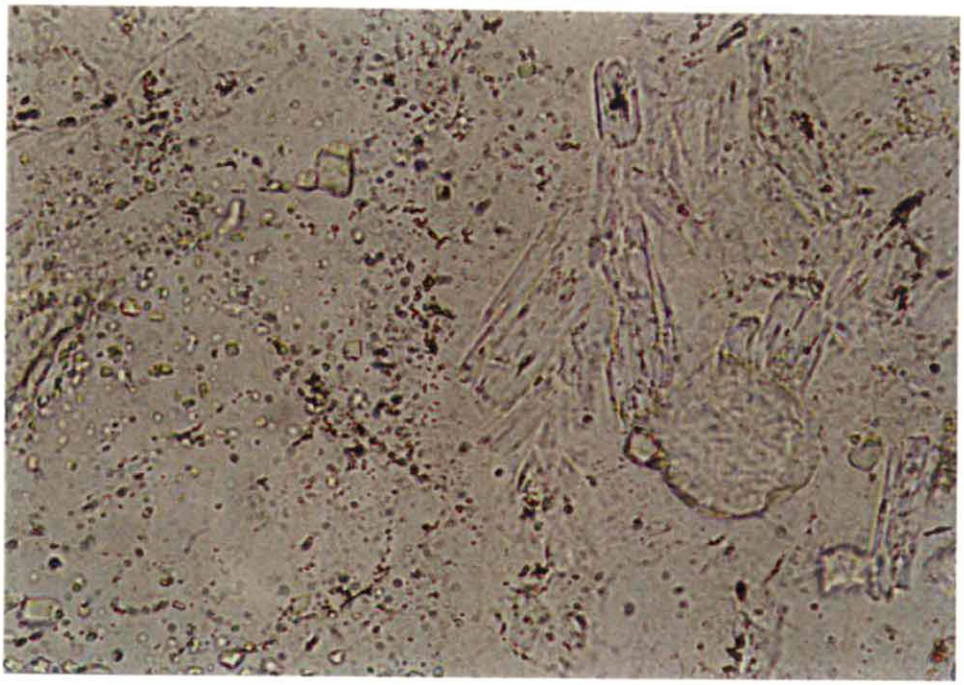
Opened



Crossed

1mm

Sample No. MJVD-8-53.70
Rock Name : Barite and REE ore
Location : Drilling core

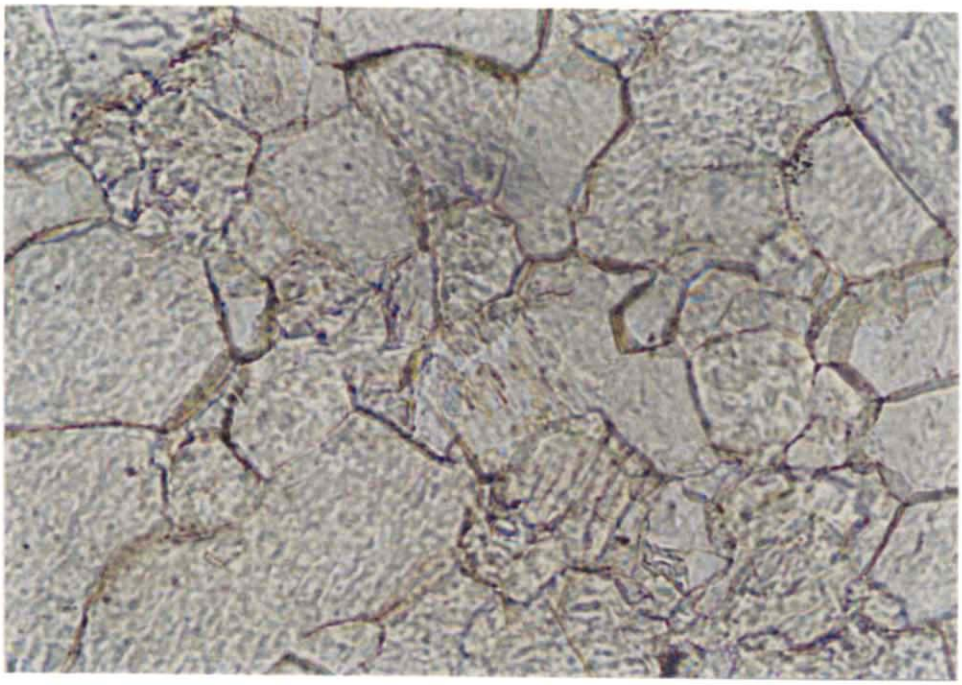


Opened

Crossed

0.5mm

Sample No. MJVD-14-79.60
Rock Name : Marble
Location : Drilling core



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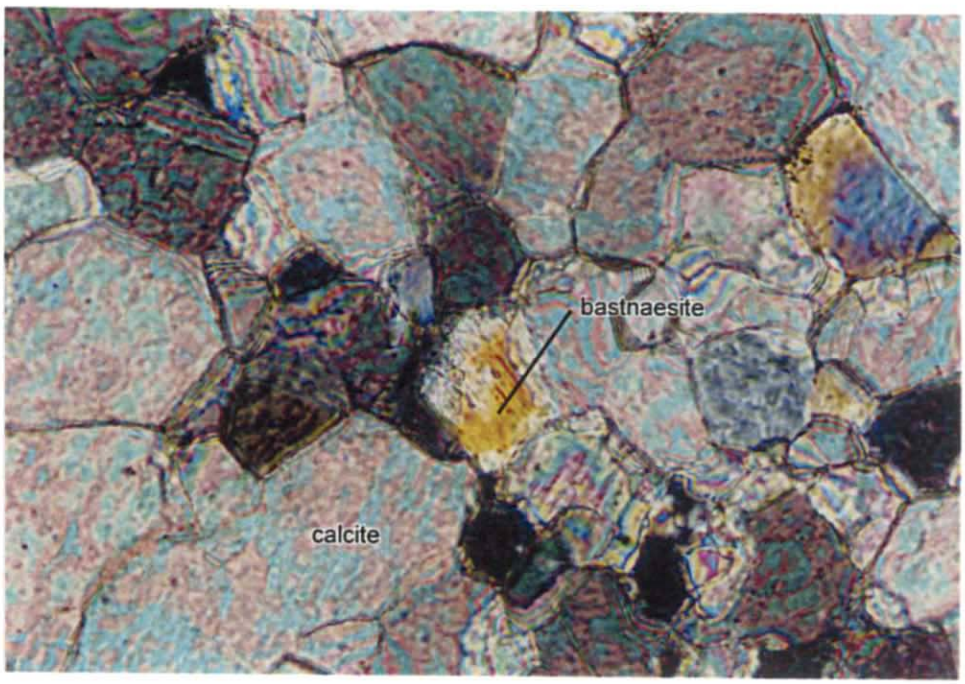


Crossed

0.1mm

Apx. 2 Results of the X-ray diffraction analyses

Table II-3-2-1 Result of the X-ray diffraction analysis

	Minerals / Sample Name	Bastnaesite	Synchysite	Monazite	Fluorite	Barite	Calcite	Calcite	Quartz	K-feldspar	Phlogopite	Illite	Kaorinite	Halloyisite	Smectite	Boehmite
1	0104-U02	△			+					◎	○	+				
2	0104-U03	△			+	○	◎		△	・		+				
3	MJVD-10-47.40 m	・	◎			○	○	△	○							
4	MJVD-10-73.10 m	△	◎	・		△		◎								
5	MJVD-10-73.85 m	+	△			◎	◎		△			+	+		+	
6	MJVD-10-93.10 m	△	○			○		◎				+				
7	MJVD-13-07.65 m	・				○		・	◎	△			◎	+		
8	MJVD-16-71.20 m					◎		・	○	・	△					+
9	MJVD-5-94.50 m		△			○	◎	◎	△	・						
10	P2-300 cm	◎				◎			△							
11	P2-330 cm	○		・		◎			・							・
12	P2-415 cm	◎				◎	・		△							
13	P2-430 cm	◎				◎			○				△			
14	P2-480 cm	○				◎										
15	P3-380 cm	○		・		◎			△							・
16	P3-470 cm	◎				○	△		△							
17	P3-540 cm	△				◎			△							

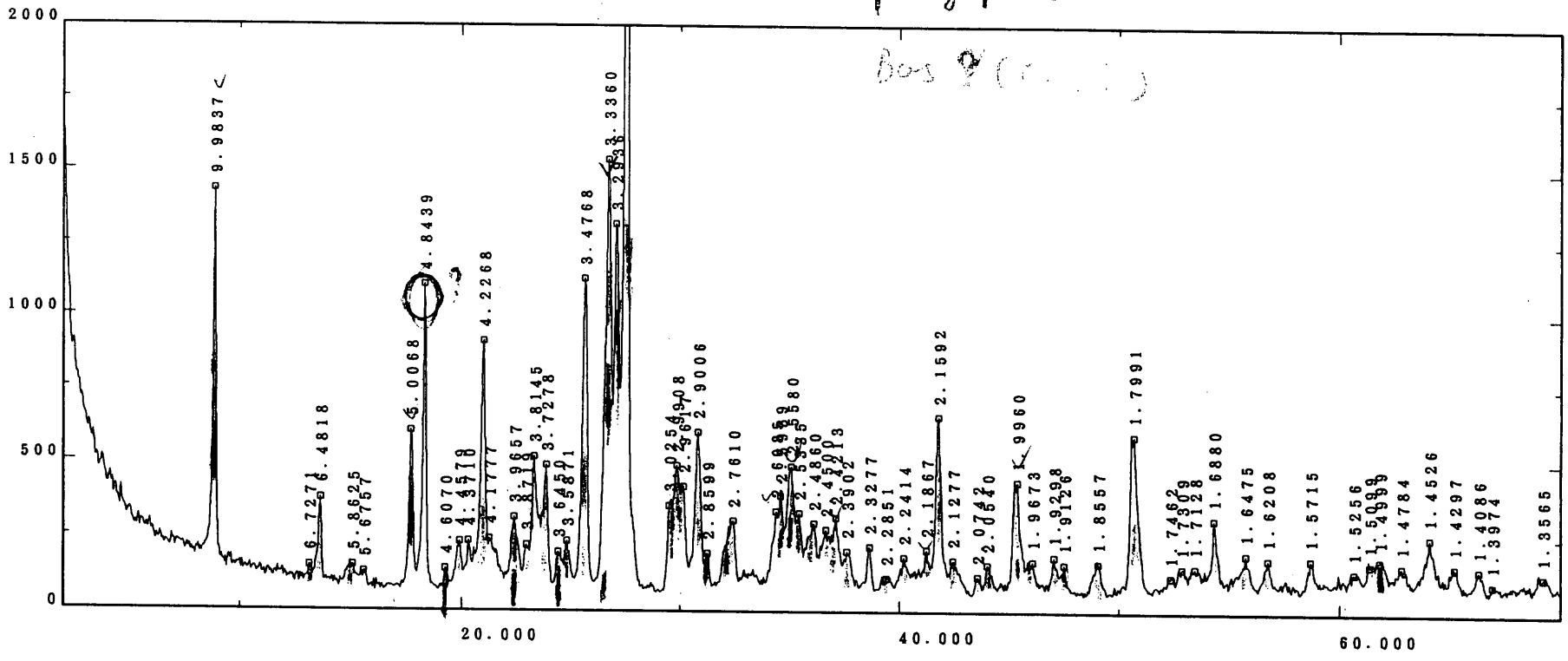
◎ : Rich
○ : Moderate
△ : Poor
・ : Very poor
\+ : Detected by thehydraulic elutration

ピークサーチ

ｻﾝﾌﾟﾙ名	: 0104-U02X	[平滑化	]
ﾌｧｲﾙ	: zeng.1081	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/2		
測定日	: 25-Nov-00 10:43	[Kα2除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

ピーク幅しきい値 : 0.05
ピーク強度しきい値 : 150.000

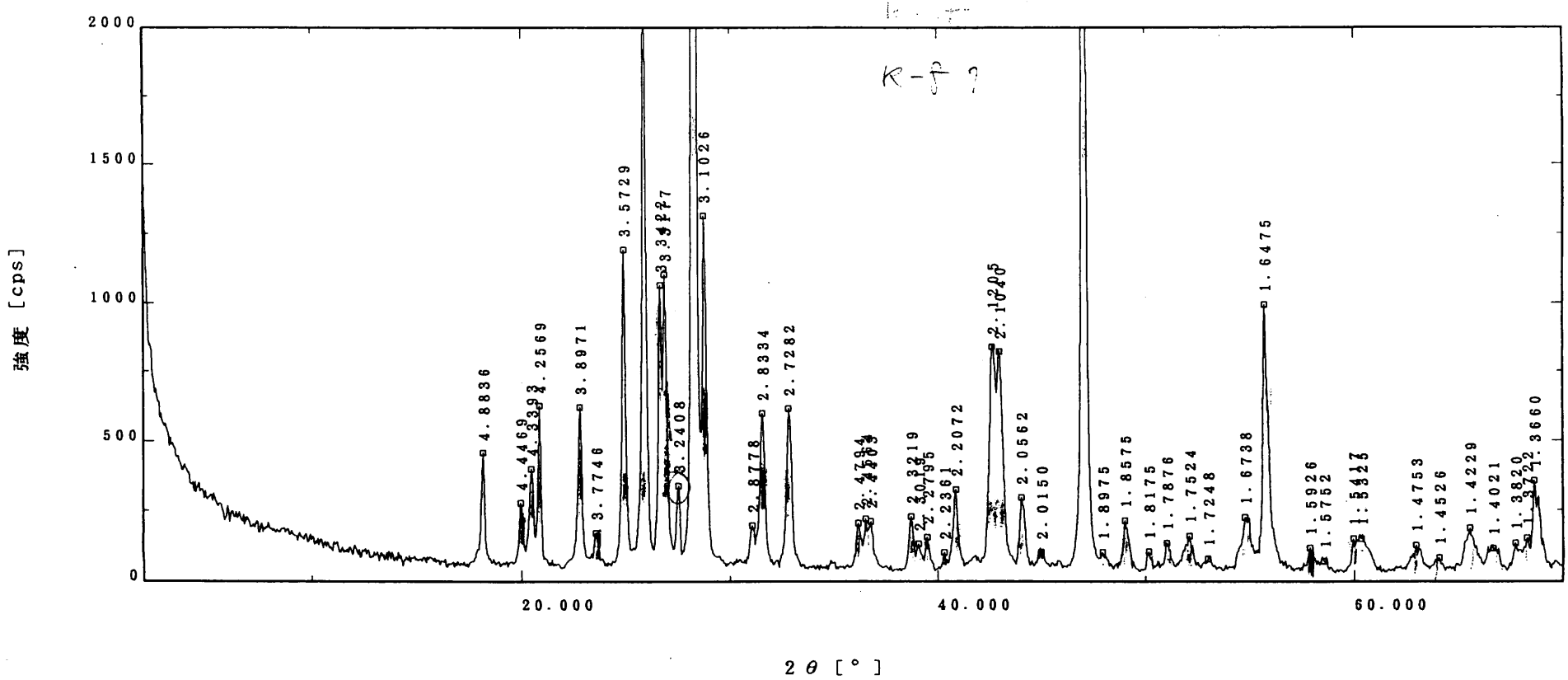
K-f
phlogopite



ピークサーチ

ｻﾝﾌﾟﾙ名	: 0104-U03X	[平滑化	]
ﾌｧｲﾙ	: zeng.1082	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/2		
測定日	: 25-Nov-00 11:19	[Kα2除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

ピーク幅しきい値　: 0.05
ピーク強度しきい値　: 150.000



ピーク サーチ

ｻﾝﾌﾟﾙ名	: MJVD-10, 47.4	[平滑化	]
ﾌｧｲﾙ	: zeng.1074	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/1		
測定日	: 25-Nov-00 03:18	[Kα2除去	]
測定者	: RINT	[ピークサーチ	]

ピーク幅しきい値 : 0.05
ピーク強度しきい値 : 150.000

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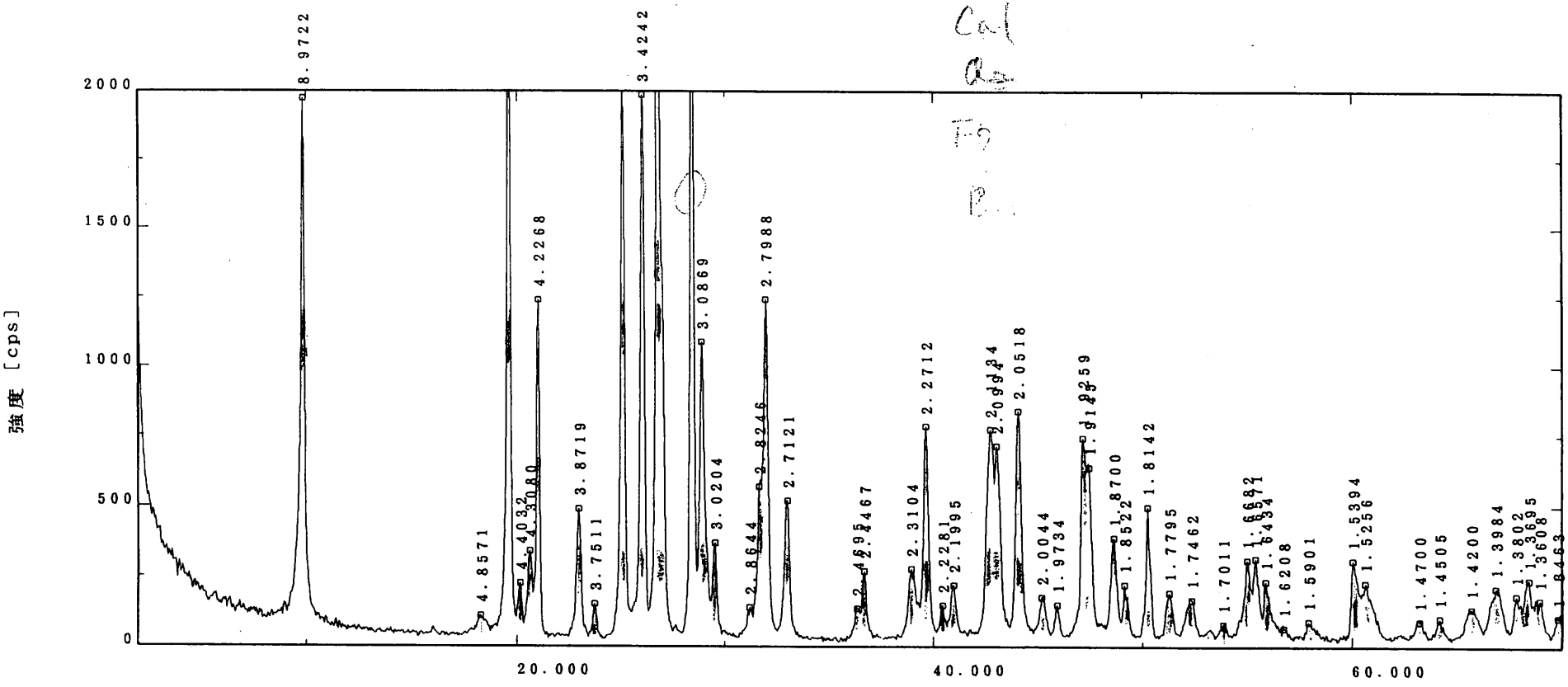

ピーク サーチ

ｻﾝﾌﾟﾙ名	: MJVD-10, 73.10	[平滑化	]
ﾌｧｲﾙ	: zeng.1075	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/1		
測定日	: 25-Nov-00 04:05	[Kα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

ピーク幅しきい値 : 0.05
ピーク強度しきい値 : 150.000

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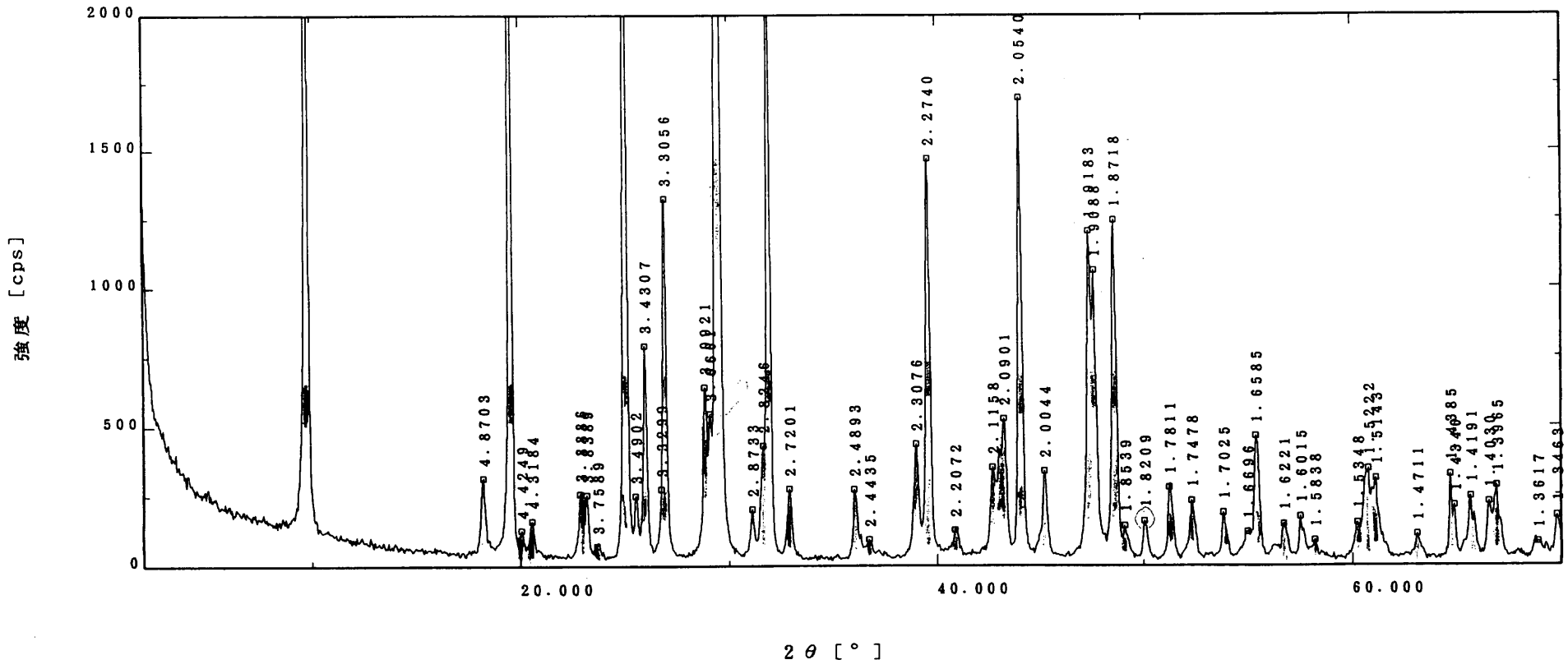
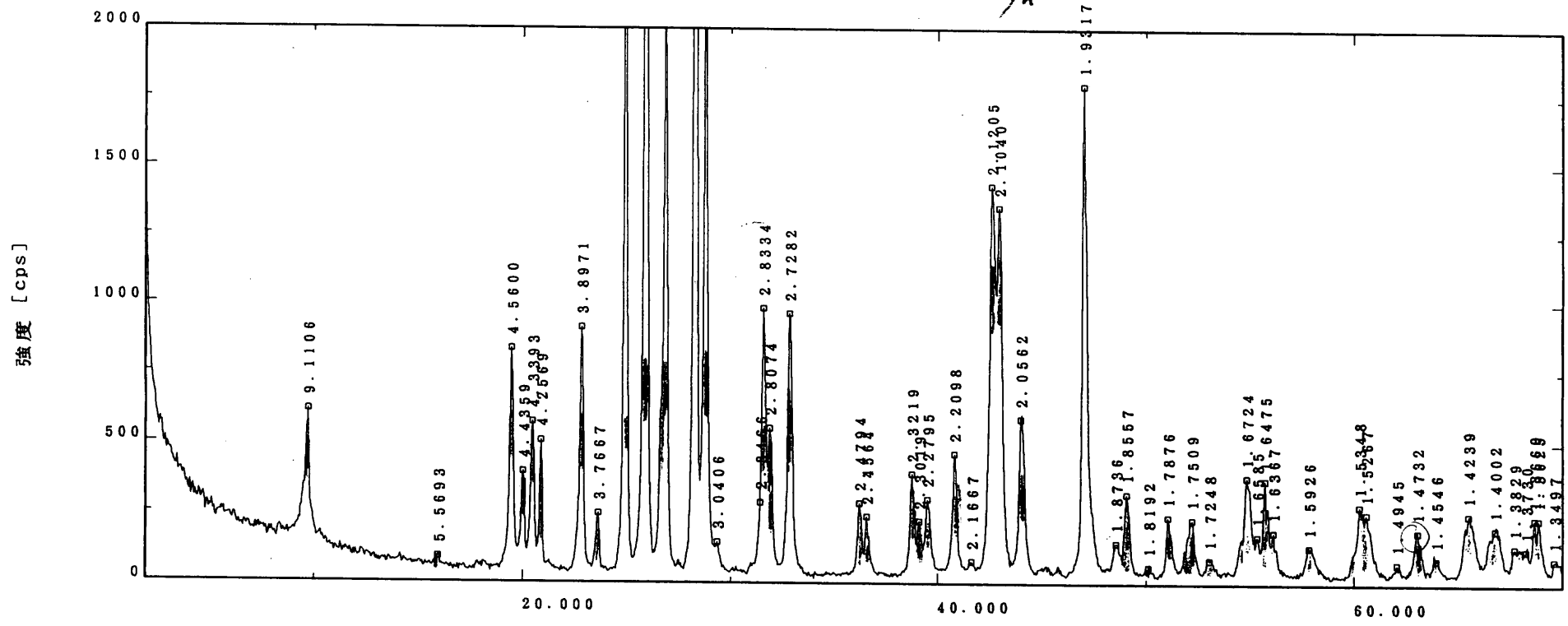


ピークサーチ

ｻﾝﾌﾟﾙ名	: MJVD-10, 73.85	[平滑化	]
ﾌｧｲﾙ	: zeng.1072	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/1		
測定日	: 25-Nov-00 02:03	[Kα2除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

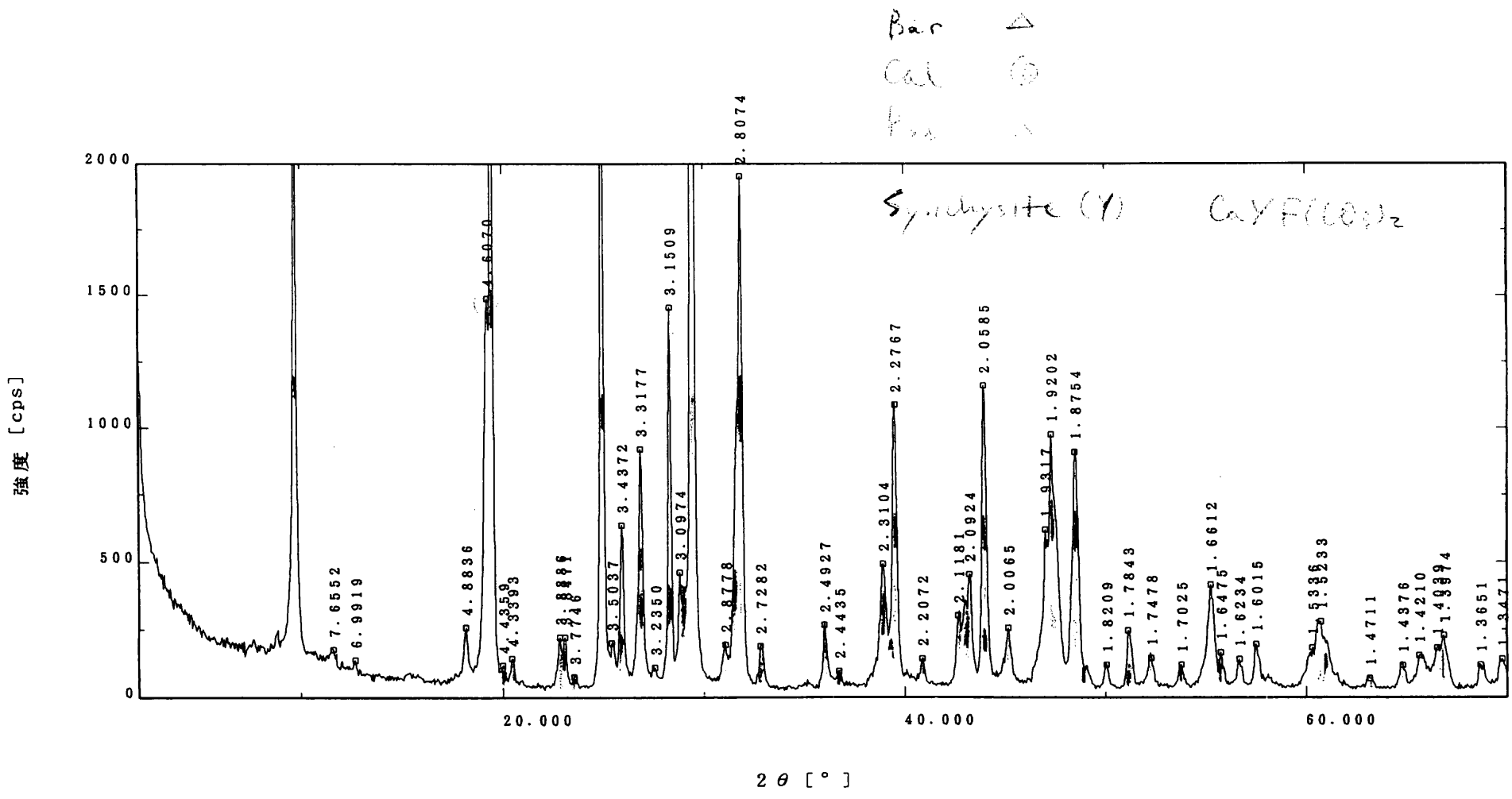
ピーク幅しきい値 : 0.05
ピーク強度しきい値 : 200.000



ピークサーチ

ｻﾝﾌﾟﾙ名	: MJVD-10, 93.10	[平滑化]
ﾌｧｲﾙ	: zeng.1073	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去]
ｺﾒﾝﾄ	: 2001/3/1	
測定日	: 25-Nov-00 02:40	[Kα2除去]
測定者	: ＲＩＮＴ	[ピークサーチ]

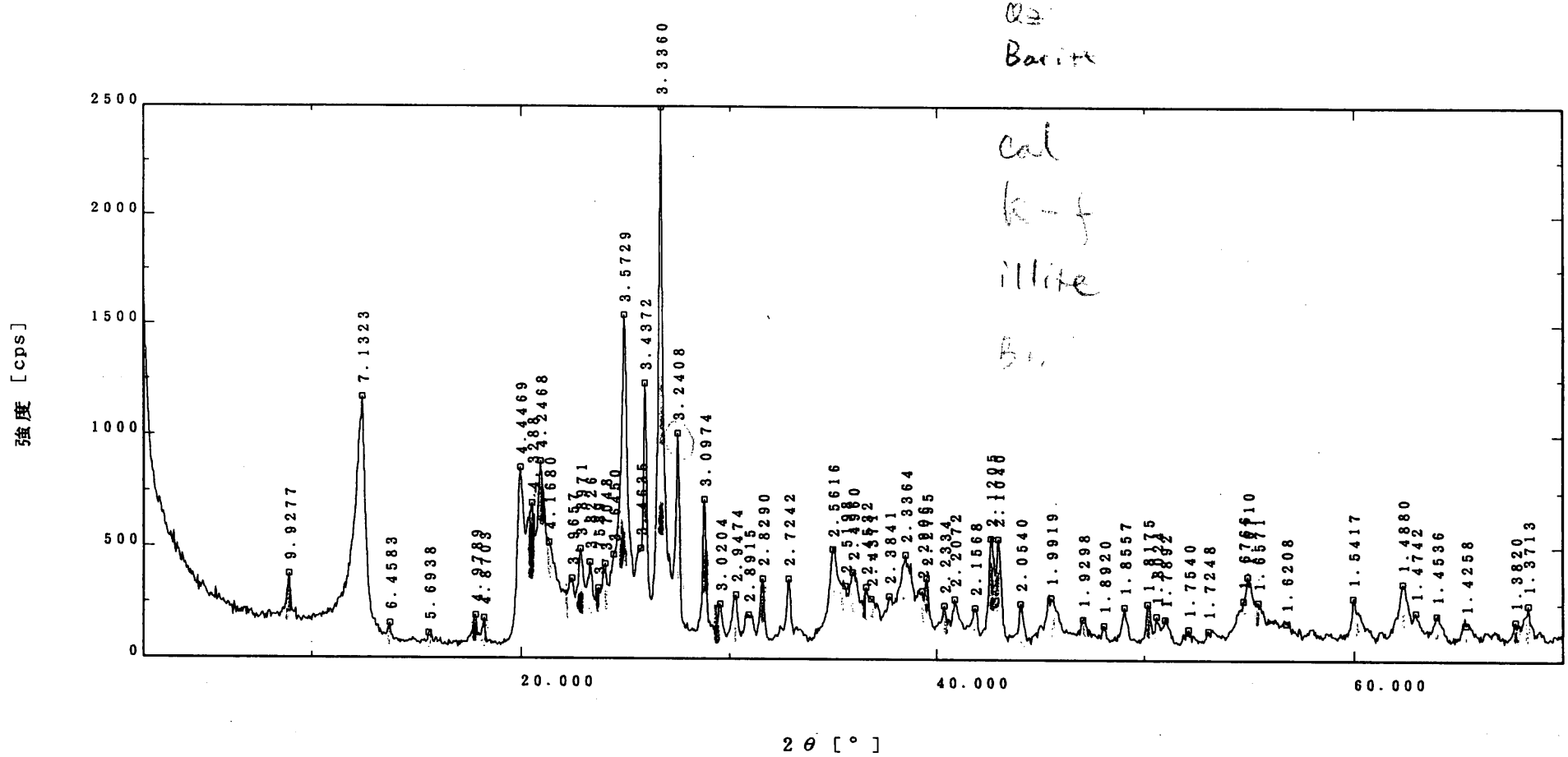
ピーク幅しきい値 : 0.05
ピーク強度しきい値 : 50.000



ピーク サーチ

ｻﾝﾌﾟﾙ名	: MJVD-13, 7.65	[平滑化	]
ﾌｧｲﾙ	: zeng.1084	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/2		
測定日	: 25-Nov-00 12:39	[Kα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

ピーク幅しきい値 : 0.05
ピーク強度しきい値 : 150.000

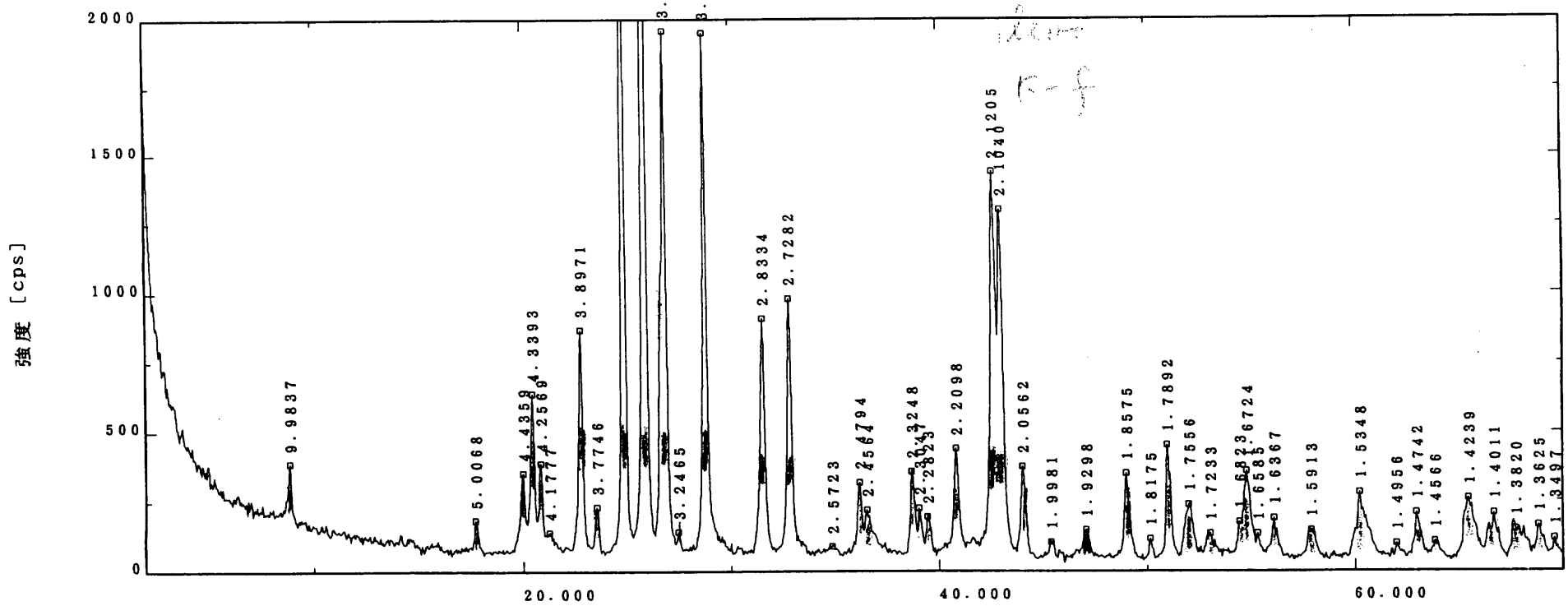


2000-Nov-25 14:32:06 Page-1

ピーク サーチ

ｻﾝﾌﾟﾙ名	: 16-71,	[平滑化	]
ﾌｧｲﾙ	: zeng.1120	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/12		
測定日	: 26-Nov-00 13:01	[Kα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

ピーク幅しきい値 : 0.05
ピーク強度しきい値 : 200.000



ピ゜ークサーチ

ｻﾝﾌﾟﾙ名	: MJVD-5, 94.50	[平滑化	]
ﾌｧｲﾙ	: zeng.1076	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/1		
測定日	: 25-Nov-00 05:15	[Ｋα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

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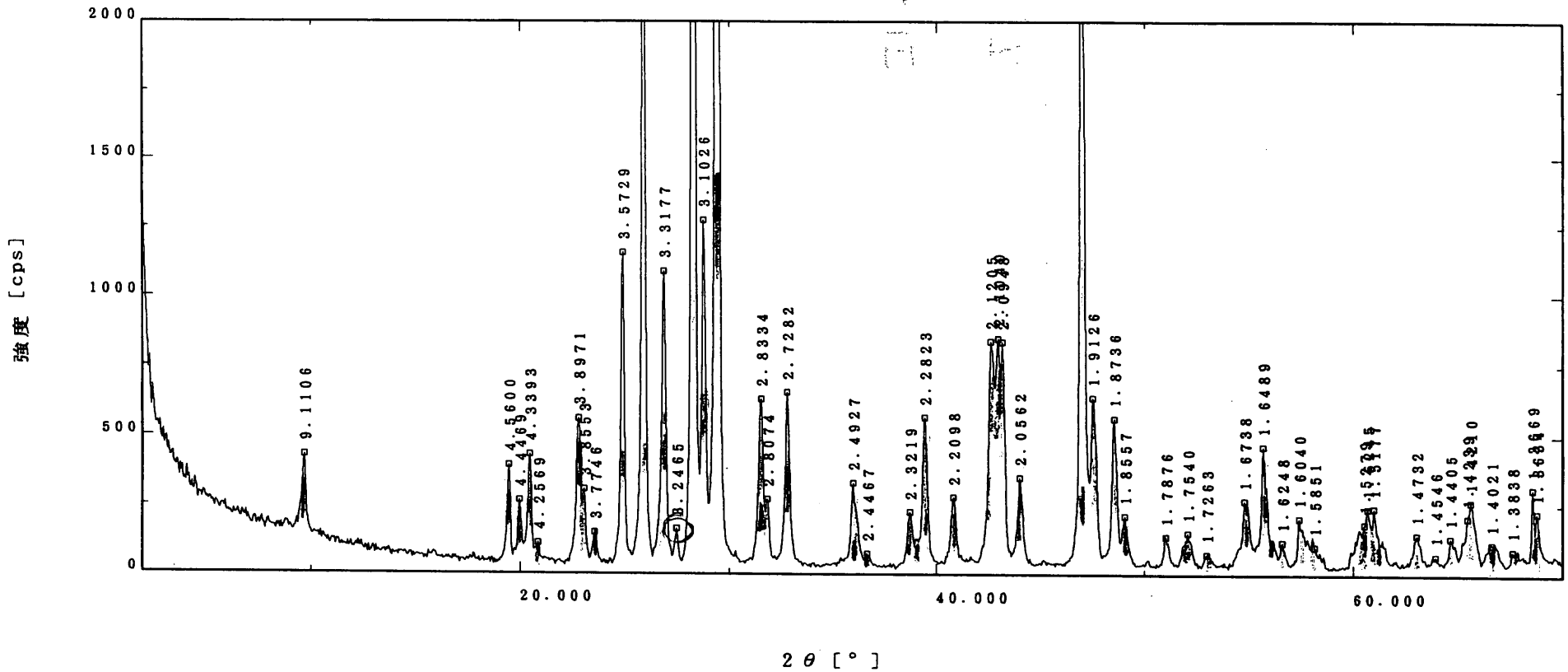
ピーク幅しきい値　: 0.05
ピーク強度しきい値　: 150.000



ピークサーチ

ｻﾝﾌﾟﾙ名	: P2-300	[平滑化	]
ﾌｧｲﾙ	: zeng.1066	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/2/28		
測定日	: 24-Nov-00 21:33	[Kα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

ピーク幅しきい値 : 0.05
ピーク強度しきい値 : 150.000

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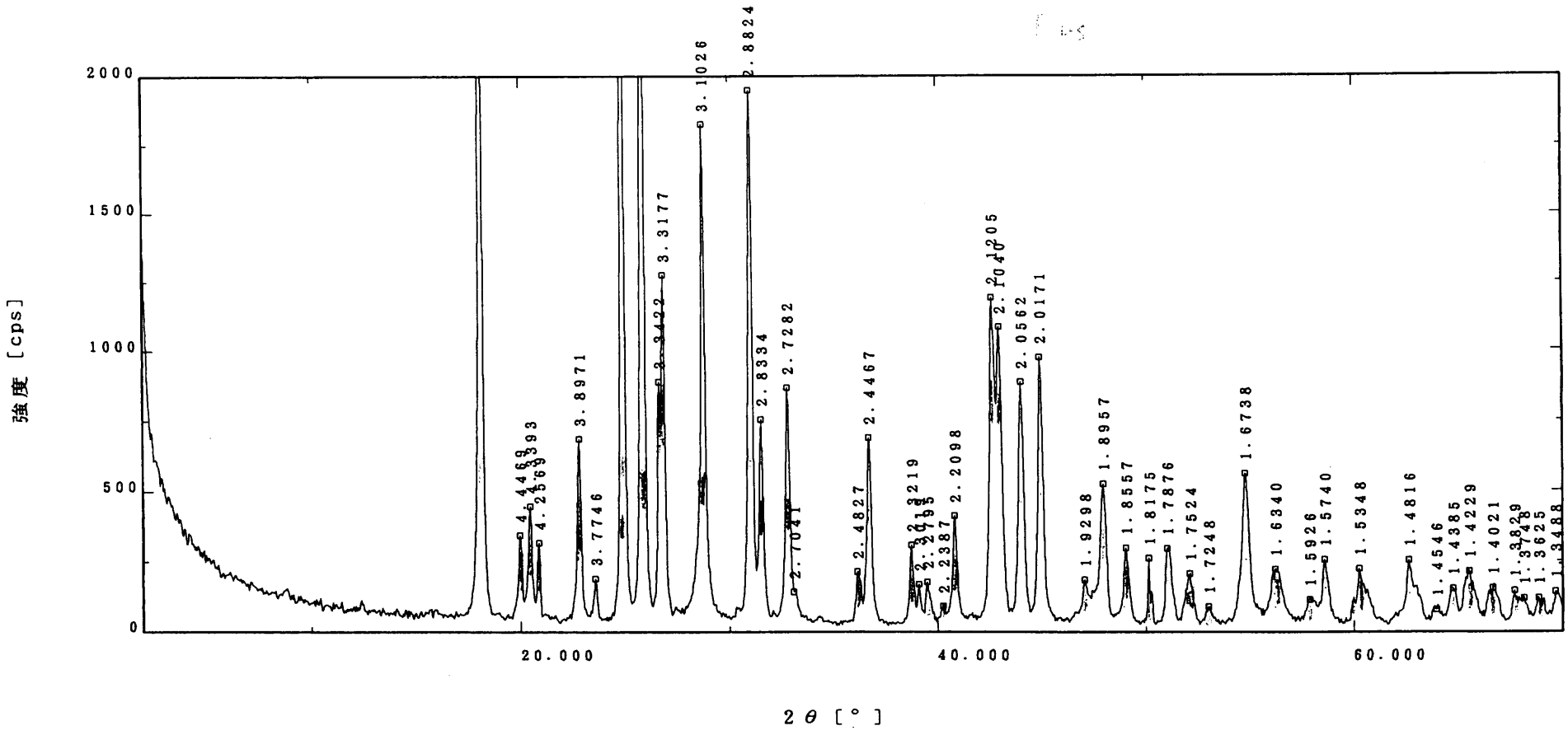
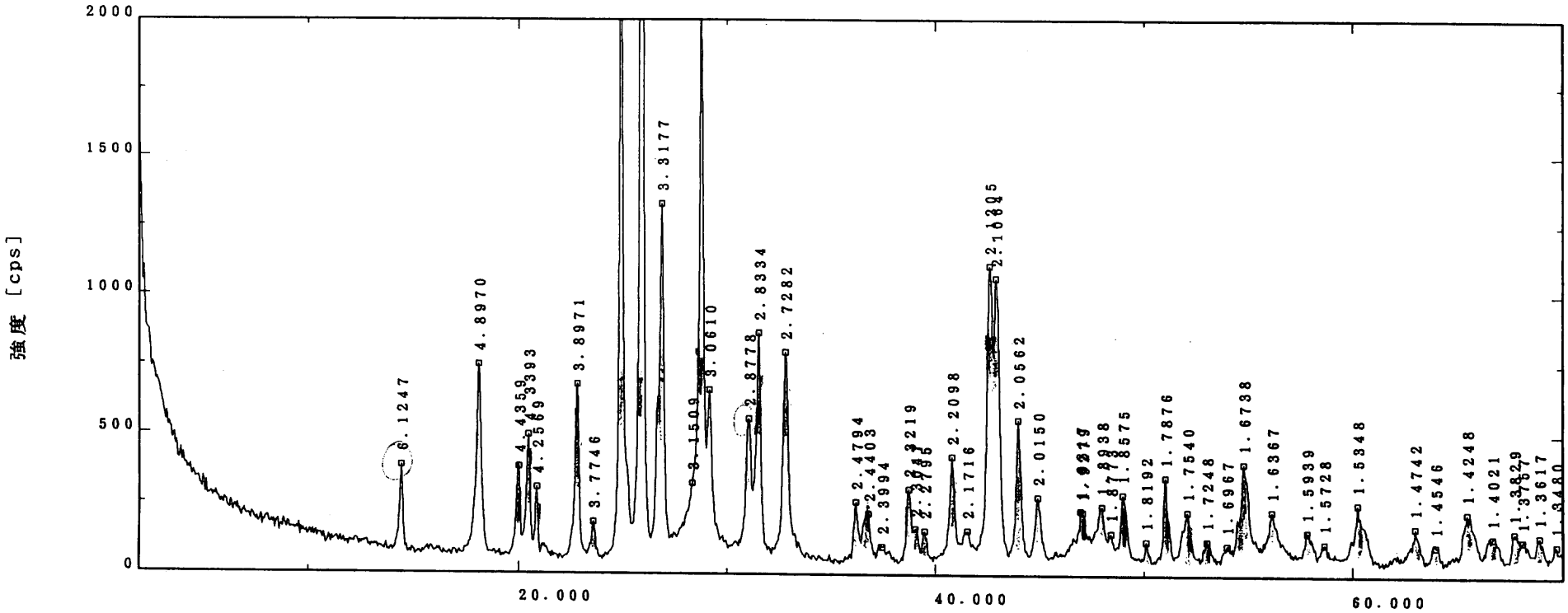


ピ゜ークサーチ

ｻﾝﾌﾟﾙ名	: P2-330	[平滑化	]
ﾌｧｲﾙ	: zeng.1083	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/2		
測定日	: 25-Nov-00 12:00	[Kα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

ピーク幅しきい値 : 0.05
ピーク強度しきい値 : 150.000

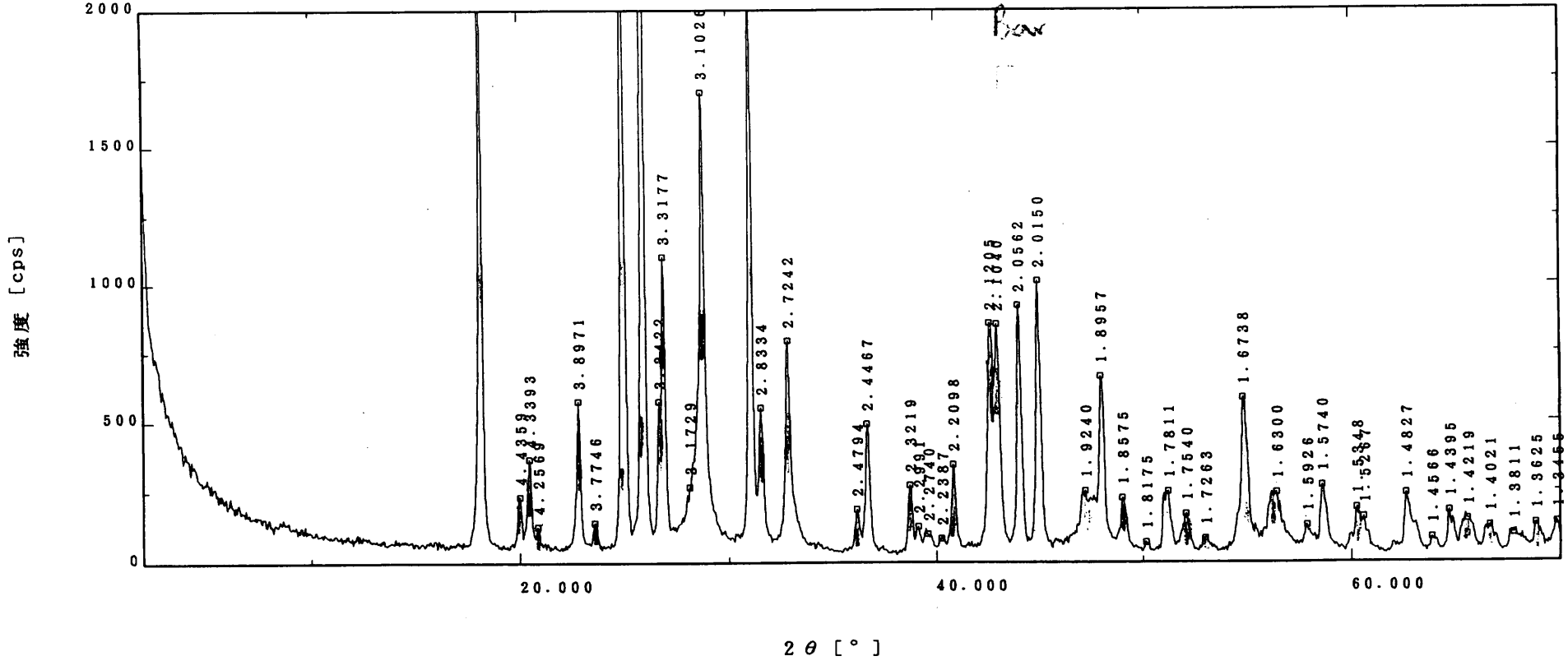
Barite



ピークサーチ

ｻﾝﾌﾟﾙ名	: P2-430	[平滑化	]
ﾌｧｲﾙ	: zeng.1071	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/1		
測定日	: 25-Nov-00 01:24	[Kα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

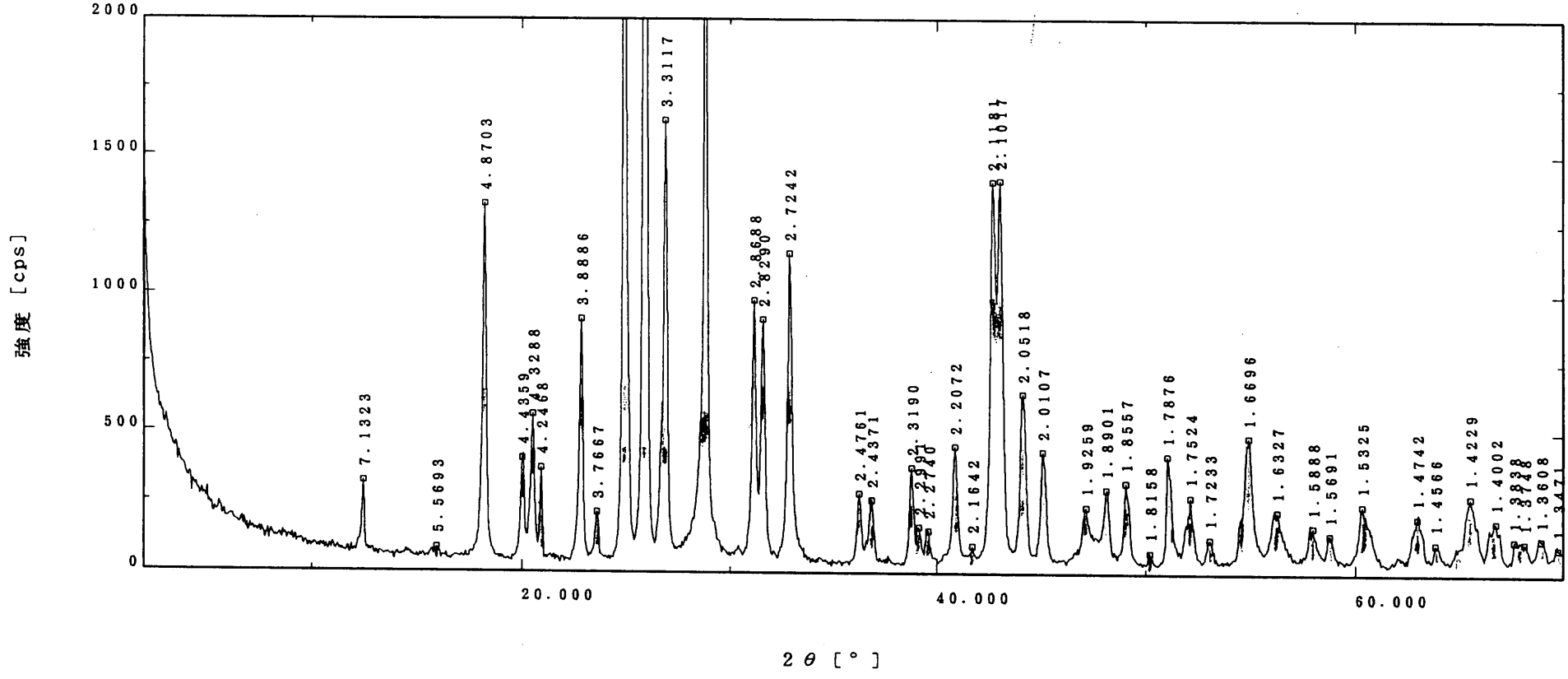
ピーク幅しきい値　: 0.05
ピーク強度しきい値　: 200.000



ピークサーチ

ｻﾝﾌﾟﾙ名	: P2-475	[平滑化	]
ﾌｧｲﾙ	: zeng.1068	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/1		
測定日	: 24-Nov-00 23:07	[Kα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

ピーク幅しきい値 : 0.05
ピーク強度しきい値 : 50.000



ピ゜ークサーチ

ｻﾝﾌﾟﾙ名	: P2-480	[平滑化	]
ﾌｧｲﾙ	: zeng.1067	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/1		
測定日	: 24-Nov-00 22:23	[Ｋα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

ピーク幅しきい値　: 0.05
ピーク強度しきい値　: 150.000

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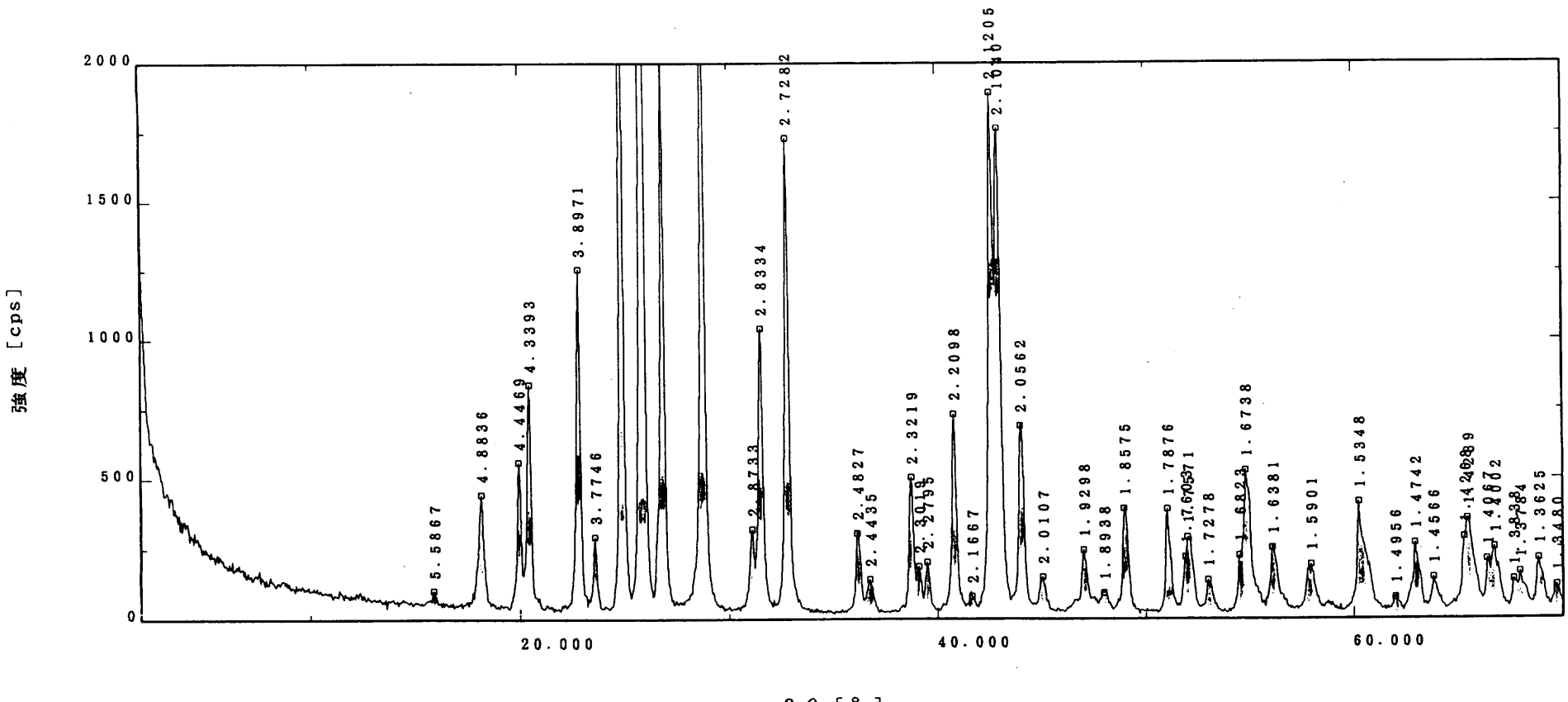
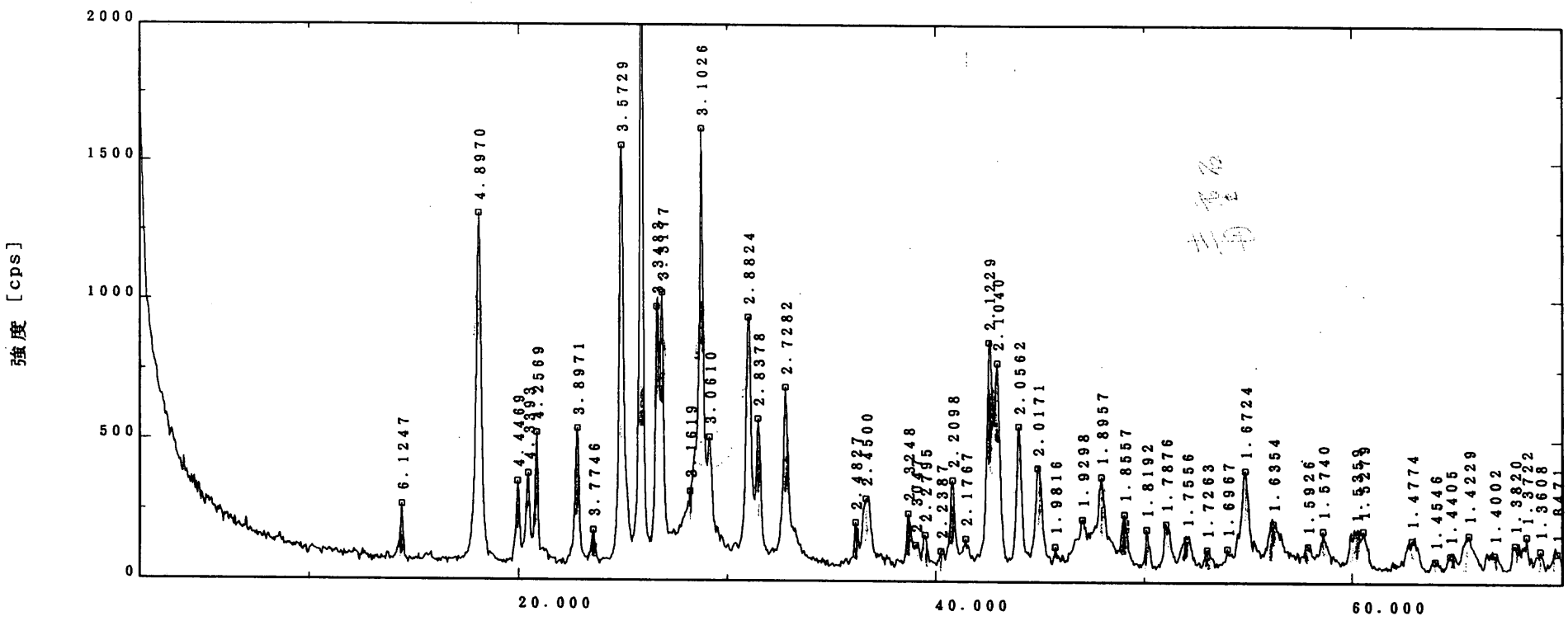


ピークサーチ

ｻﾝﾌﾟﾙ名	: P3-380	[平滑化	]
ﾌｧｲﾙ	: zeng.1070	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/1		
測定日	: 25-Nov-00 00:48	[Ｋα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

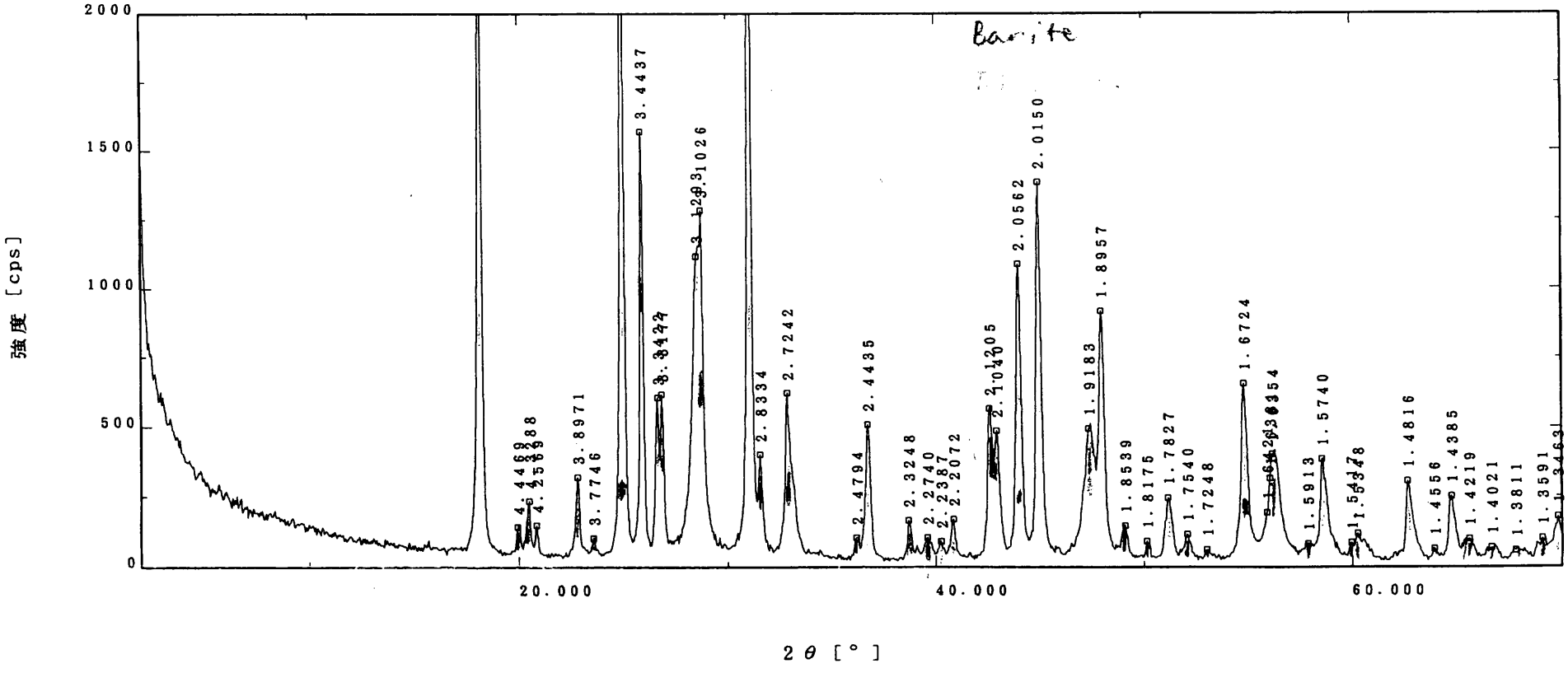
ピーク幅しきい値　：0.05
ピーク強度しきい値　：200.000



ピーク サーチ

ｻﾝﾌﾟﾙ名	: P3-470	[平滑化	]
ﾌｧｲﾙ	: zeng.1065	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/2/28		
測定日	: 24-Nov-00 20:46	[Ｋα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

ピーク幅しきい値 : 0.05
ピーク強度しきい値 : 150.000



ピークサーチ

ｻﾝﾌﾟﾙ名	: P3-540	[平滑化	]
ﾌｧｲﾙ	: zeng.1069	[ﾊﾞｯｸｸﾞﾗｳﾝﾄﾞ除去	]
ｺﾒﾝﾄ	: 2001/3/1		
測定日	: 24-Nov-00 23:57	[Kα２除去	]
測定者	: ＲＩＮＴ	[ピークサーチ	]

ピーク幅しきい値　: 0.05
ピーク強度しきい値　: 50.000

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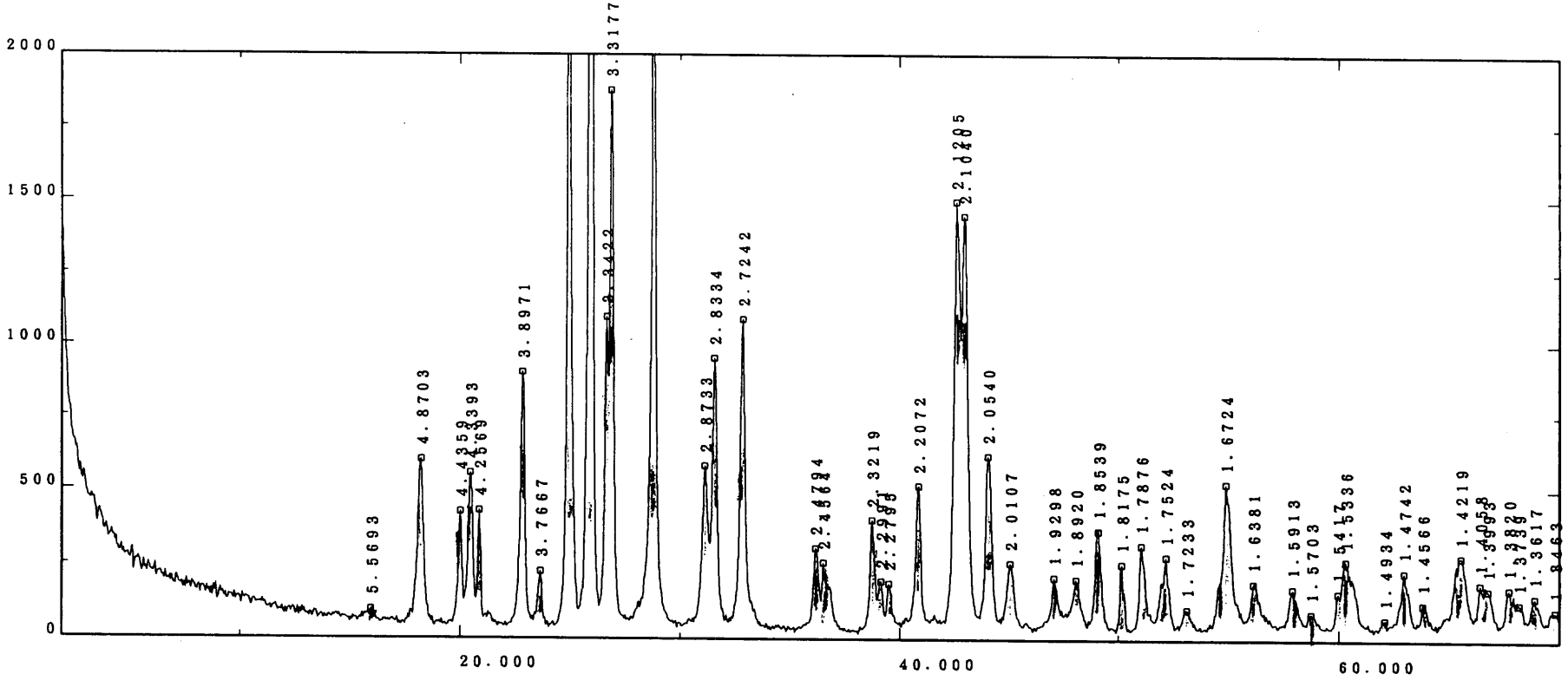


Apx. 3 Assay results of whole rocks and ore samples

Whole rock analysis

Sample Name		0104-U05	0107-U01	0112-U05	0115-N02	0115-U02	0115-U05	0115-U06	0115-I112	H-02	MJVD-11-70.40
Al_2O_3	%	2.48	22.81	15.20	13.68	0.20	16.18	15.86	12.21	15.59	0.26
CaO	%	0.20	0.20	1.34	0.16	25.00	0.82	0.43	0.24	0.06	49.00
Cr_2O_3	%	0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fe_2O_3	%	0.39	5.15	8.07	3.80	1.16	0.94	1.22	5.50	5.58	0.40
MgO	%	0.09	0.32	0.21	15.13	10.91	0.48	0.67	0.05	0.02	0.21
MnO	%	<0.01	0.03	0.01	0.06	2.24	0.07	0.04	0.02	0.05	0.53
P_2O_5	%	0.06	0.42	1.16	0.42	0.04	0.10	<0.01	0.12	0.09	0.11
K_2O	%	0.39	11.16	11.44	9.68	0.16	10.53	3.26	9.93	11.86	0.26
SiO_2	%	89.00	52.50	57.07	48.78	3.78	64.95	74.00	61.74	64.75	3.42
Na_2O	%	0.15	0.30	0.43	0.47	0.17	0.37	0.14	0.26	0.75	0.17
TiO_2	%	0.13	1.12	1.28	0.30	0.02	0.33	0.23	0.20	0.56	0.03
LOI	%	6.57	4.02	0.95	5.36	29.50	2.88	5.04	2.36	1.27	38.79
TOTAL	%	99.47	98.03	97.19	97.84	73.18	97.65	100.90	92.63	100.60	93.18
Ba	ppm	1,135	2,780	>10,000	>10,000	>10,000	>10,000	2140	>10,000	5,680	>10,000
Ce	ppm	92	1,180	1,315	2,740	26,100	926	249	978	195	5,180
Cs	ppm	1	2	2	14	0	6	9	1	6	0.3
Co	ppm	1	1	26	2	1	<0.5	2	2	6	1.5
Cu	ppm	20	45	70	75	20	15	20	25	30	40
Dy	ppm	2	24	16	10	109	6	6	10	6	37.5
Er	ppm	1	17	10	7	89	5	5	6	4	25.2
Eu	ppm	1	16	15	<25.0	100	<10.0	6	<50.0	3	<50.0
F	%	0.08	1.67	0.03	0.09	4.11	0.12	0.09	0.07	0.03	0.24
Gd	ppm	2.6	36.6	37.9	30.9	285	15.1	17.3	31.9	7.9	109.5
Ga	ppm	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Hf	ppm	<1	29	9	5	1	6	4	6	10	4
Ho	ppm	0	5	3	2	24	1	1	2	1	7
La	ppm	113	1,175	756	1,095	20,100	738	1,040	571	168	3,560
Pb	ppm	20	45	190	340	845	60	160	475	405	385
Lu	ppm	0	1	0	0	5	0	0	0	0	1
Nd	ppm	32	377	511	603	4,980	244	254	391	76	1,530
Ni	ppm	<5	<5	15	<5	<5	<5	<5	<5	<5	<5
Nb	ppm	<1	77	50	56	<1	17	<1	21	15	91
Pr	ppm	11	136	149	196	1,985	87	94	112	24	502
Rb	ppm	20	300	302	735	2	479	162	328	386	10
Sm	ppm	5	53	76	79	471	31	24	80	13	207
Ag	ppm	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sr	ppm	86	880	2,150	1,060	2,830	1,320	559	1,145	1,015	4,530
Ta	ppm	<0.5	3	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tb	ppm	0	5	4	4	37	2	2	3	1	13
Tl	ppm	<0.5	11	12	4	<0.5	5	3	2	1	<0.5
Th	ppm	5	115	86	40	175	38	1	179	23	10
Tm	ppm	0	2	1	1	8	0	0	0	1	2
Sn	ppm	<1	2	4	3	<1	<1	<1	1	3	<1
W	ppm	2	104	96	17	8	33	5	11	6	13
U	ppm	1	28	30	24	47	8	7	30	10	33
V	ppm	<5	265	145	370	95	25	30	55	125	25
Yb	ppm	0	9	4	2	37	2	2	2	2	8
Y	ppm	7	146	87	55	694	41	48	38	34	190
Zn	ppm	<5	330	<5	115	230	<5	10	265	<5	395
Zr	ppm	33	1,280	472	261	19	260	159	319	432	212

Assay of ore (1/5)

	Sample Name	T-R_2O_3	CaF_2	$BaSO_4$	F	Ba	Ag	Al	As	B	Be	Bi	Ca
		%	%	%	%	%	ppm	%	ppm	ppm	ppm	ppm	%
1	0104-U01	0.34	0.51	1.53	0.3	0.9	0.8	2.27	16	10	<5.0	<10	0.02
2	0104-U02	0.38	0.37	1.70	0.2	1.0	3.2	4.08	42	<10	5	<10	0.03
3	0104-U03	4.44	40.79	25.92	19.9	15.3	1.6	0.70	98	1,550	5	<10	6.89
4	0107-U01	0.52	2.96	4.45	1.4	2.6	0.4	3.34	42	<10	10	<10	0.03
5	0108-U01	0.04	0.16	0.46	0.1	0.3	<0.2	0.03	10	<10	<5.0	<10	>15.00
6	0112-U02	0.43	0.06	7.46	0.0	4.4	3.6	0.16	26	<10	<5.0	<10	0.08
7	0112-U03	0.42	0.29	1.05	0.1	0.6	<0.2	4.00	66	<10	10	<10	0.22
8	0112-U04	4.54	15.82	23.45	7.7	13.8	3.4	0.69	254	950	20	<10	4.44
9	0115-N01	0.04	0.31	0.29	0.2	0.2	<0.2	0.13	24	<10	<5.0	<10	>15.00
10	0115-N02	0.36	0.18	0.49	0.1	0.3	<0.2	2.31	510	<10	<5.0	<10	0.3
11	0115-U01	0.02	0.02	0.27	0.0	0.2	<0.2	0.02	14	<10	<5.0	<10	>15.00
12	0115-U03	0.02	0.21	0.24	0.1	0.1	<0.2	0.06	34	<10	<5.0	<10	>15.00
13	0115-U05	0.09	0.21	3.06	0.1	1.8	<0.2	0.46	58	<10	<5.0	<10	0.31
14	0115-U07	0.37	1.23	0.42	0.6	0.3	<0.2	1.57	64	<10	<5.0	<10	1.33
15	0115-U08	0.48	3.47	0.41	1.7	0.2	<0.2	2.57	70	<10	15	<10	0.03
16	0115-U09	0.45	0.33	3.08	0.2	1.8	<0.2	1.50	48	<10	<5.0	<10	0.05
17	0115-U10	0.87	0.47	5.06	0.2	3.0	<0.2	5.72	112	<10	<5.0	<10	<0.01
18	0115-U11	11.09	24.35	47.76	11.9	28.1	<0.2	0.47	180	2,000	<5.0	<10	6.67
19	0115-U12	0.12	0.10	8.33	0.1	4.9	<0.2	0.43	104	<10	<5.0	<10	0.04
20	0115-U13	0.48	0.21	2.46	0.1	1.5	8.4	0.94	122	<10	15	<10	0.05
21	0115-U14	3.48	0.58	25.58	0.3	15.1	2.6	0.59	200	<10	5	<10	0.1
22	0116-U02	1.15	0.41	35.35	0.2	20.8	1.2	0.70	70	<10	15	<10	0.03
23	0116-U03	1.69	0.29	39.26	0.1	23.1	1.2	0.74	102	<10	15	10	0.03
24	0116-U04	8.73	1.32	68.15	0.6	40.1	<0.2	0.16	308	30	<5.0	<10	0.03
25	1220-U06	4.39	0.06	80.22	0.0	47.2	<0.2	0.09	106	<10	<5.0	<10	0.01
26	1228-U09	2.58	37.09	37.73	18.1	22.2	<0.2	0.74	64	1,550	<5.0	<10	7.84
27	1228-U10	6.40	50.34	29.83	24.5	17.6	<0.2	0.41	102	2,890	<5.0	<10	9.69
28	1228-U11	8.00	37.91	39.60	18.5	23.3	0.2	0.37	172	2,700	<5.0	<10	8.81
29	F1-N01	1.12	69.04	9.57	33.6	5.6	<0.2	0.35	46	2,900	<5.0	<10	9.81
30	F1-N02	3.76	70.27	4.35	34.2	2.6	<0.2	0.37	90	3,180	<5.0	<10	10.45
31	F1-N03	0.42	71.10	8.87	34.6	5.2	<0.2	0.35	18	3,050	<5.0	<10	10.05
32	F1-N04	1.53	25.07	51.33	12.2	30.2	<0.2	0.26	90	1,880	<5.0	<10	6.43
33	F1-U01	2.22	1.09	51.84	0.5	30.5	<0.2	0.18	176	170	<5.0	<10	0.52
34	F1-U02	1.01	0.29	40.45	0.1	23.8	<0.2	0.08	78	10	<5.0	<10	0.07
35	F4-U01	4.87	57.74	15.45	28.1	9.1	<0.2	0.36	142	3,110	<5.0	<10	9.99
36	F4-U02	1.33	44.38	42.83	21.6	25.2	<0.2	0.33	42	2,920	<5.0	<10	9.69
37	F4-U03	0.78	43.36	40.79	21.1	24.0	<0.2	0.29	28	2,290	<5.0	<10	7.93
38	F4-U05	1.58	0.27	83.28	0.1	49.0	<0.2	0.20	76	20	<5.0	<10	0.04
39	F4-U06	4.07	0.53	75.80	0.3	44.6	0.4	0.20	204	40	<5.0	<10	0.06
40	P1B-04	5.19	1.79	15.69	0.9	9.2	<0.2	0.05	156	310	<5.0	<10	>15.00
41	P2-300	11.87	1.52	76.14	0.7	44.8	0.2	0.12	666	240	<5.0	<10	0.14
42	P2-330	6.00	0.43	72.57	0.2	42.7	1	0.11	346	<10	<5.0	30	0.07
43	P2-475	4.32	0.49	80.73	0.2	47.5	0.2	0.13	244	<10	<5.0	<10	0.04
44	P2-430	22.08	3.51	53.19	1.7	31.3	0.4	0.15	1025	270	<5.0	40	0.33
45	P2-480	3.23	0.41	71.38	0.2	42.0	0.2	0.05	188	60	<5.0	<10	0.03
46	P3-380	8.67	0.68	56.25	0.3	33.1	0.6	0.15	422	10	<5.0	<10	0.05
47	P3-470	39.79	5.98	25.66	2.9	15.1	<0.2	0.10	1335	310	<5.0	<10	0.19
48	P3-540	0.10	0.84	70.02	0.4	41.2	0.2	0.07	284	50	<5.0	<10	0.03
49	P3-550	4.72	0.72	53.36	0.4	31.4	0.2	0.03	310	140	<5.0	<10	0.05
50	MJVD-07N1	2.10	0.43	71.72	0.2	42.2	0.4	0.51	180	10	<5.0	<10	0.11

Assay of ore (2/5)

	Sample Name	Cd	Co	Cr	Cu	Fe	Ga	Hg	K	Mg	Mn	Mo	Na
		ppm	ppm	ppm	ppm	%	ppm	ppm	%	%	ppm	ppm	%
1	0104-U01	0.5	31	38	210	7.06	<100	<1	0.13	<0.01	1,180	54	<0.01
2	0104-U02	2	69	50	81	7.22	<100	<1	0.12	0.03	>10000	42	<0.01
3	0104-U03	2.5	46	30	402	2.58	<100	<1	0.43	0.03	>10000	404	0.23
4	0107-U01	<0.5	40	<1	289	2.04	<100	<1	2.13	3.21	365	35	0.08
5	0108-U01	<0.5	98	<1	555	0.12	<100	<1	0.01	8.39	450	<1	<0.01
6	0112-U02	4	20	46	140	1.97	<100	<1	0.04	0.04	>10000	143	<0.01
7	0112-U03	1	36	389	168	4.12	<100	<1	0.02	0.36	1,120	5	<0.01
8	0112-U04	6.5	7	3	108	5.06	<100	<1	0.31	0.05	>10000	446	0.14
9	0115-N01	<0.5	37	9	211	0.34	<100	<1	0.02	0.3	315	7	<0.01
10	0115-N02	<0.5	4	5	41	3.73	<100	<1	0.13	0.01	140	226	<0.01
11	0115-U01	<0.5	7	<1	41	0.08	<100	1	<0.01	11.95	250	<1	0.02
12	0115-U03	<0.5	20	6	114	0.17	<100	<1	0.06	0.16	225	8	<0.01
13	0115-U05	<0.5	1	13	3	0.39	<100	<1	0.13	0.08	240	3	<0.01
14	0115-U07	<0.5	7	22	13	1.93	<100	<1	0.4	0.52	1,250	11	0.01
15	0115-U08	<0.5	25	42	75	2.34	<100	<1	0.74	1.21	9,620	49	0.01
16	0115-U09	<0.5	<1	11	<1	0.74	<100	<1	0.1	<0.01	20	5	<0.01
17	0115-U10	<0.5	16	52	48	2.87	<100	<1	0.04	0.03	4,610	27	<0.01
18	0115-U11	<0.5	<1	40	19	0.93	<100	<1	0.14	0.01	5,460	59	0.27
19	0115-U12	<0.5	73	20	353	3.2	<100	<1	0.1	0.01	285	46	0.01
20	0115-U13	2	100	60	228	8.39	<100	8	0.09	<0.01	>10000	174	<0.01
21	0115-U14	8	21	97	481	5.51	<100	6	0.21	<0.01	>10000	264	<0.01
22	0116-U02	0.5	23	39	44	5.78	<100	3	0.08	0.02	>10000	18	<0.01
23	0116-U03	2	25	29	99	5.45	<100	4	0.09	0.05	>10000	13	<0.01
24	0116-U04	0.5	4	15	18	2	<100	2	0.01	<0.01	>10000	52	0.01
25	1220-U06	1	<1	7	12	1.11	<100	<1	<0.01	<0.01	6,510	6	<0.01
26	1228-U09	<0.5	3	36	42	0.9	<100	<1	0.36	0.05	1,110	5	0.23
27	1228-U10	<0.5	<1	20	14	0.36	<100	<1	0.23	0.01	590	4	0.43
28	1228-U11	<0.5	<1	10	25	0.48	<100	<1	0.2	0.01	6,060	13	0.4
29	F1-N01	<0.5	<1	29	10	0.45	<100	<1	0.21	0.01	410	318	0.43
30	F1-N02	<0.5	<1	25	14	0.41	<100	<1	0.23	0.01	70	769	0.47
31	F1-N03	<0.5	<1	16	4	0.16	<100	<1	0.21	0.01	85	215	0.43
32	F1-N04	<0.5	12	22	46	1.42	<100	1	0.13	<0.01	1,645	338	0.27
33	F1-U01	<0.5	18	55	104	0.91	<100	<1	0.01	<0.01	2,040	1680	0.03
34	F1-U02	<0.5	22	41	104	0.41	<100	<1	<0.01	<0.01	280	1050	<0.01
35	F4-U01	<0.5	<1	5	45	0.59	<100	<1	0.22	0.01	840	91	0.47
36	F4-U02	<0.5	<1	5	7	0.67	<100	<1	0.2	0.01	2,360	53	0.42
37	F4-U03	<0.5	<1	14	6	0.69	<100	<1	0.15	0.01	2,550	46	0.33
38	F4-U05	<0.5	<1	12	15	1.36	<100	<1	<0.01	<0.01	120	16	<0.01
39	F4-U06	0.5	<1	3	15	0.75	<100	1	<0.01	<0.01	6,740	44	0.01
40	P1B-04	2	28	<1	245	0.12	<100	<1	0.03	0.04	2,070	5	0.08
41	P2-300	2.5	9	4	79	0.41	<100	<1	0.04	<0.01	1,555	13	0.04
42	P2-330	2.5	1	15	152	1.13	<100	3	0.01	<0.01	>10000	22	0.01
43	P2-475	1	<1	10	35	0.56	<100	<1	0.02	<0.01	4,240	10	<0.01
44	P2-430	10	6	12	136	0.85	<100	<1	0.04	<0.01	4,400	19	0.06
45	P2-480	0.5	<1	10	21	0.22	<100	<1	<0.01	<0.01	1,330	5	0.01
46	P3-380	1	3	24	181	3.05	<100	1	0.01	<0.01	>10000	19	0.01
47	P3-470	3	<1	122	61	0.13	<100	<1	0.03	<0.01	190	16	0.06
48	P3-540	<0.5	1	31	43	2.15	<100	<1	<0.01	<0.01	2,910	9	0.01
49	P3-550	0.5	28	29	139	0.5	<100	<1	0.01	<0.01	185	6	0.03
50	MJVD-07N1	1	8	23	121	4.41	<100	<1	0.03	0.01	8,760	63	<0.01

Assay of ore (3/5)

	Sample Name	Ni	P	Pb	S	Sb	Sc	Sn	Rb	Sr	Ti	Tl	V
		ppm	ppm	%	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm
1	0104-U01	10	310	564	0.06	8	<20	3	549	32	<0.01	<100	41
2	0104-U02	90	1,640	954	0.02	18	40	5	450	92	<0.01	<100	52
3	0104-U03	29	170	2	0.06	70	<20	8	17.6	271	<0.01	<100	139
4	0107-U01	<1	220	284	0.06	22	<20	3	622	101	0.01	<100	107
5	0108-U01	1	40	72	0.02	2	<20	<1	2.8	720	<0.01	<100	13
6	0112-U02	<1	160	1	0.01	44	<20	3	5.4	1015	<0.01	<100	26
7	0112-U03	164	2,100	242	0.01	2	<20	2	12.4	479	0.05	<100	87
8	0112-U04	<1	300	2,590	<0.01	76	<20	2	12.2	416	<0.01	<100	97
9	0115-N01	4	160	10	0.03	2	<20	1	9	173	<0.01	<100	16
10	0115-N02	3	1,250	114	0.02	6	<20	2	308	176	<0.01	<100	9
11	0115-U01	3	50	14	<0.01	6	<20	<1	1.4	568	<0.01	<100	16
12	0115-U03	1	90	22	0.01	<2	<20	<1	10.2	202	<0.01	<100	20
13	0115-U05	<1	50	28	0.06	<2	<20	1	495	150	<0.01	<100	2
14	0115-U07	11	220	116	0.01	<2	<20	<1	558	82	<0.01	<100	57
15	0115-U08	32	130	1,025	0.01	8	<20	<1	678	109	0.01	<100	66
16	0115-U09	1	40	126	0.06	<2	<20	1	381	86	<0.01	<100	6
17	0115-U10	6	200	1,080	0.06	8	<20	1	217	93	<0.01	<100	52
18	0115-U11	2	120	8,560	0.06	14	<20	<1	1	417	<0.01	<100	133
19	0115-U12	12	50	426	0.06	4	<20	<1	337	110	<0.01	<100	24
20	0115-U13	223	1,500	724	0.01	58	40	3	494	170	<0.01	<100	176
21	0115-U14	205	780	9,230	0.02	158	20	17	386	373	<0.01	<100	265
22	0116-U02	43	800	2,240	0.04	10	<20	1	138.5	172	0.01	<100	130
23	0116-U03	69	1,850	2,950	0.03	12	<20	1	136.5	266	0.02	<100	144
24	0116-U04	9	1,040	3,570	0.03	16	<20	<1	2.2	662	<0.01	<100	105
25	1220-U06	<1	2,530	708	0.04	8	<20	<1	1	272	<0.01	<100	58
26	1228-U09	1	40	1,435	0.06	34	<20	1	22.2	443	<0.01	<100	253
27	1228-U10	<1	40	888	0.06	8	<20	<1	2.2	436	<0.01	<100	124
28	1228-U11	1	50	4,690	0.06	6	<20	<1	1.8	570	<0.01	<100	147
29	F1-N01	<1	60	1,195	0.06	6	<20	2	1.2	764	<0.01	<100	17
30	F1-N02	<1	30	1,960	0.06	6	<20	<1	0.8	882	<0.01	<100	4
31	F1-N03	1	30	636	0.06	<2	<20	2	1	726	<0.01	<100	3
32	F1-N04	3	250	3,660	0.06	32	<20	<1	<0.2	574	<0.01	<100	30
33	F1-U01	4	910	7,510	0.05	16	<20	1	0.6	615	<0.01	<100	42
34	F1-U02	<1	670	3,950	0.05	8	<20	2	1.6	498	<0.01	<100	15
35	F4-U01	<1	240	1,670	0.05	20	<20	1	0.4	505	<0.01	<100	99
36	F4-U02	1	90	2,250	0.06	2	<20	1	<0.2	588	<0.01	<100	14
37	F4-U03	1	80	2,530	0.05	<2	<20	<1	<0.2	622	<0.01	<100	15
38	F4-U05	<1	1,750	658	0.03	6	<20	<1	<0.2	341	<0.01	<100	16
39	F4-U06	1	3,480	3,390	0.03	10	<20	1	0.4	575	<0.01	<100	24
40	P1B-04	1	4,050	940	0.1	6	<20	<1	1.2	7360	<0.01	<100	21
41	P2-300	2	340	812	0.05	16	<20	<1	2.8	962	<0.01	<100	15
42	P2-330	6	3,360	8,310	0.03	68	<20	<1	2.4	609	<0.01	<100	58
43	P2-475	2	600	2,490	0.04	10	<20	<1	2.4	569	<0.01	<100	24
44	P2-430	<1	1,920	4,370	0.06	44	<20	3	3.2	1570	0.01	<100	37
45	P2-480	<1	360	722	0.05	26	<20	<1	1	395	<0.01	<100	11
46	P3-380	8	2,390	1	0.04	64	<20	<1	1	659	0.01	<100	430
47	P3-470	<1	260	906	0.06	4	<20	<1	0.4	1855	0.01	<100	30
48	P3-540	6	510	1,700	0.05	74	<20	<1	0.6	573	0.01	<100	63
49	P3-550	<1	100	290	0.05	10	<20	26	219	552	<0.01	<100	16
50	MJVD-07N1	15	2,560	4,620	0.04	28	<20	<1	27.4	268	<0.01	<100	72

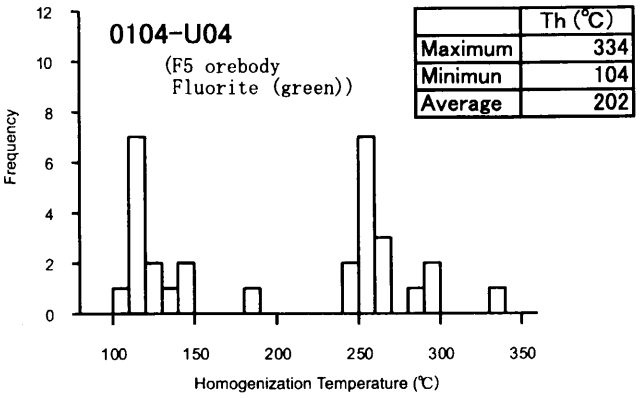
Assay of ore (4/5)

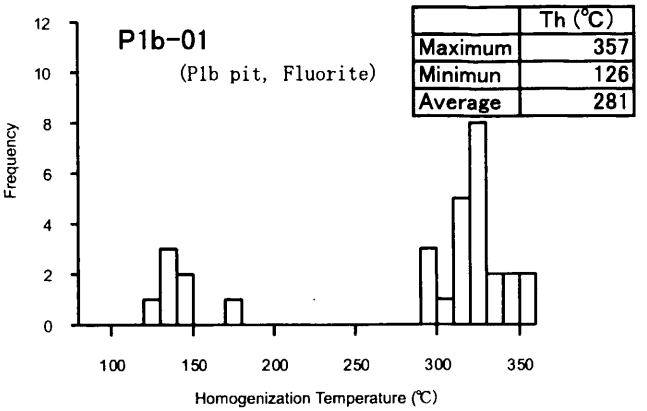
	Sample Name	W	Zr	Zn	Cs	Hf	Nb	Ta	Y	La	Ce	Pr	Nd
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
1	0104-U01	<10	346	462	0.8	10	43	<0.5	350	758	959	124	382
2	0104-U02	10	406	328	1.2	10	42	<0.5	239	1,200	977	130	337
3	0104-U03	10	79	1765	0.4	6	26	<0.5	3,430	9,270	15,440	1,630	4,590
4	0107-U01	<10	244	84	9.4	5	74	<0.5	63	1,070	2,330	183	570
5	0108-U01	10	<0.5	36	<0.1	<1	7	<0.5	23	119	155	14	41
6	0112-U02	10	32	1420	0.5	1	2	<0.5	1,030	213	1,655	57	184
7	0112-U03	<10	198	90	2.3	5	9	<0.5	247	1,600	526	227	674
8	0112-U04	30	41	3480	<0.1	5	10	<0.5	4,220	7,370	15,470	1,780	5,490
9	0115-N01	10	11	16	0.2	<1	<1	<0.5	27	96	123	16	48
10	0115-N02	10	1,555	42	1.1	31	82	1	174	1,095	1,045	140	398
11	0115-U01	10	16	18	<0.1	<1	<1	<0.5	10	62	86	9	27
12	0115-U03	<10	12	16	0.2	<1	<1	<0.5	6	61	79	8	23
13	0115-U05	<10	284	16	13	6	20	<0.5	22	262	313	38	108
14	0115-U07	<10	317	128	10.2	6	25	<0.5	50	1,320	1,120	142	375
15	0115-U08	<10	268	172	20.9	5	48	<0.5	125	1,455	1,485	199	522
16	0115-U09	<10	398	28	5.8	8	26	<0.5	29	1,715	1,265	183	469
17	0115-U10	60	573	258	2.6	12	39	<0.5	53	2,680	3,550	237	591
18	0115-U11	30	26	226	<0.1	2	7	<0.5	556	37,900	42,200	3,080	7,440
19	0115-U12	<10	363	252	0.5	7	19	<0.5	28	335	463	39	105
20	0115-U13	10	267	1970	2.5	8	37	<0.5	686	1,410	616	206	582
21	0115-U14	10	165	1940	0.8	6	31	<0.5	3,140	5,680	12,110	1,335	4,110
22	0116-U02	10	229	682	4	5	193	<0.5	120	3,470	4,430	365	964
23	0116-U03	10	193	686	5.3	5	228	<0.5	189	4,960	6,320	615	1,580
24	0116-U04	50	115	270	<0.1	3	165	<0.5	270	29,200	33,200	2,610	6,490
25	1220-U06	<10	<0.5	178	<0.1	3	<1	<0.5	57	5,540	26,500	940	2,510
26	1228-U09	10	106	184	0.4	4	34	<0.5	176	8,880	9,540	752	1,820
27	1228-U10	<10	19	72	<0.1	2	16	<0.5	397	21,500	24,300	1,850	4,570
28	1228-U11	20	9	126	<0.1	2	2	<0.5	640	22,800	32,300	2,650	6,960
29	F1-N01	<10	17	52	<0.1	2	39	<0.5	115	3,600	4,230	338	837
30	F1-N02	<10	19	22	<0.1	1	24	<0.5	192	12,210	14,680	1,145	2,710
31	F1-N03	<10	14	14	<0.1	1	19	<0.5	78	1,280	1,545	129	333
32	F1-N04	<10	6	126	<0.1	1	6	<0.5	122	4,400	6,080	514	1,325
33	F1-U01	10	8	136	<0.1	2	52	2	295	8,720	6,650	682	1,755
34	F1-U02	<10	<0.5	38	0.1	2	34	<0.5	139	3,720	3,230	315	769
35	F4-U01	30	21	44	<0.1	2	11	<0.5	297	14,210	19,940	1,500	3,800
36	F4-U02	<10	14	44	<0.1	2	25	0.5	126	4,550	4,730	382	1,005
37	F4-U03	<10	10	22	<0.1	2	10	<0.5	112	2,540	2,730	229	636
38	F4-U05	<10	9	188	<0.1	3	7	<0.5	86	5,570	5,660	445	1,080
39	F4-U06	10	15	86	<0.1	2	8	0.5	276	14,350	14,710	1,165	2,830
40	P1B-04	<10	22	210	<0.1	1	18	<0.5	190	12,090	21,900	2,030	5,930
41	P2-300	10	3	130	<0.1	3	23	0.5	372	43,900	36,900	4,340	11,740
42	P2-330	70	61	706	<0.1	4	272	1	455	16,470	23,500	2,110	5,940
43	P2-475	20	47	218	<0.1	4	53	<0.5	320	11,810	15,410	1,805	5,420
44	P2-430	30	2	400	<0.1	3	45	<0.5	781	75,500	76,700	7,340	20,100
45	P2-480	10	23	70	<0.1	3	1	<0.5	400	8,090	12,780	1,170	3,520
46	P3-380	120	327	764	0.1	6	279	0.5	669	25,300	34,000	2,800	7,860
47	P3-470	10	94	42	<0.1	5	15	<0.5	2,730	133,400	142,900	12,390	34,200
48	P3-540	120	6	370	<0.1	2	3	<0.5	13	304	358	39	98
49	P3-550	10	2,370	88	5	43	47	0.5	600	15,550	14,320	2,000	5,840
50	MJVD-07N1	<10	64	720	0.9	2	202	1	255	6,080	7,040	862	2,540

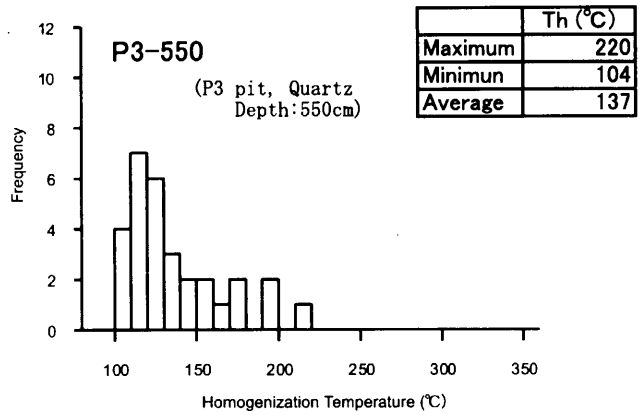
Assay of ore (5/5)

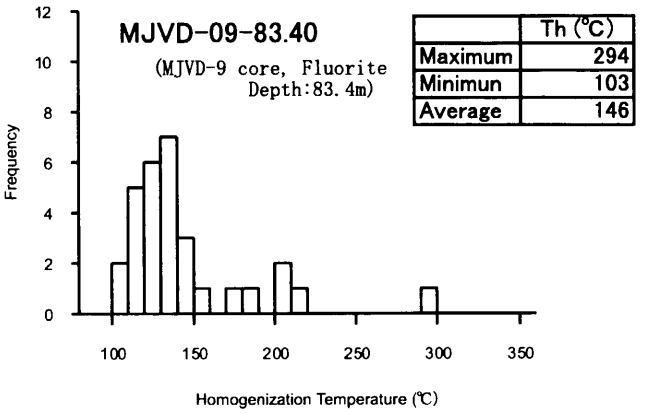
	Sample Name	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	Th	U
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
1	0104-U01	68.4	19.7	48.7	6.8	39.5	8.5	28	3.3	16.2	2.4	20	56
2	0104-U02	68.1	19.6	48.4	6.7	36	7	21	2.9	15.5	2.1	16	44.5
3	0104-U03	895	200	627	69	320	62.7	192	16.4	70.7	9.1	187	115.5
4	0107-U01	70.9	<20.0	35.5	3.7	10.8	2	7.8	0.4	2.7	0.3	58	24.5
5	0108-U01	8.4	1.9	5.2	0.6	1.8	0.5	1.4	0.1	0.7	<0.1	<1	2
6	0112-U02	72.7	<40.0	43.5	8.6	68.2	18.8	75.8	10.1	47.4	7.1	55	27
7	0112-U03	86.6	27	68.7	7	26.8	5.7	18.4	1.4	6.3	0.9	16	11
8	0112-U04	1210	300	899	97.1	439	78.1	228	17.2	79.8	9.8	287	108.5
9	0115-N01	9.4	1.8	6.1	0.5	2.8	0.4	2	0.1	0.7	<0.1	<1	15
10	0115-N02	61.8	18.4	46.4	5.8	27.5	5.6	19.7	1.8	9.1	1.2	110	29
11	0115-U01	4.7	0.5	2.8	0.2	0.9	0.1	0.8	<0.1	<0.1	<0.1	<1	0.5
12	0115-U03	3.3	0.2	2.4	0.2	0.1	0.2	1	<0.1	0.1	<0.1	<1	8.5
13	0115-U05	20.8	<20.0	8.1	0.9	2.4	0.5	2	0.2	0.9	<0.1	38	5
14	0115-U07	37.9	9.6	25.2	2.5	6.8	1.4	6.2	0.5	2.1	0.3	40	11.5
15	0115-U08	69.3	18.6	45.2	4.9	19.2	4	13.3	1.2	6.8	0.8	43	22
16	0115-U09	47.4	<20.0	26.7	2.6	6.3	0.9	4.5	0.2	1.4	0.1	61	10.5
17	0115-U10	61	<20.0	32	3.5	7.4	1.4	7	0.5	2.4	0.2	81	25
18	0115-U11	665	<250	398	42.5	81.3	13.9	67.1	3.1	13.5	1.5	239	104
19	0115-U12	30.8	<40.0	8	0.9	2.6	0.6	2.6	0.2	1.1	0.1	51	24
20	0115-U13	121.5	40	102.5	14.9	83.8	17.5	58.3	6.6	30.4	3.8	15	57
21	0115-U14	916	200	619	67.6	310	58.9	192	18.8	81.2	10.8	145	101
22	0116-U02	169.5	<200	60.4	6.2	15.1	3.2	13.5	1	4.4	0.8	97	64
23	0116-U03	236	<200	90.2	10.3	26.5	5	22.1	1.7	7.7	1	124	68.5
24	0116-U04	583	<200	292	30.6	43.5	7.4	46.9	1.5	7.9	1.1	154	150
25	1220-U06	450	<200	133	17	24.7	3.1	18.9	0.6	3.1	0.5	16	76.5
26	1228-U09	224	<200	95.2	10.1	20.7	3.7	17	0.8	4	0.5	92	56
27	1228-U10	409	<200	242	25.1	52.2	8	42.4	1.8	8.1	1	63	121.5
28	1228-U11	676	<200	403	38.4	77	11.7	60.4	2.2	10.6	1.1	210	65.5
29	F1-N01	93.9	<50.0	51.5	5.9	15.2	2.4	9.4	0.6	2.9	0.2	17	30
30	F1-N02	177.5	40	130	14.1	24.1	4.3	23.4	0.7	4.4	0.4	46	40
31	F1-N03	54.2	<40.0	25.3	2.3	7.6	1.4	5.1	0.4	1.8	0.2	<1	18
32	F1-N04	229	<300	65.2	7.1	14.6	2.5	13.9	0.8	3.2	0.5	13	46
33	F1-U01	275	<300	130	14.2	43.9	8	29.4	2.1	9.6	1.2	11	98
34	F1-U02	161.5	<300	54	6.2	19.2	3.7	14.2	1.1	5	0.5	4	65.5
35	F4-U01	359	80	220	22.1	47.3	7.9	38	1.9	8	1	40	178.5
36	F4-U02	195	<300	62.7	6.7	16.6	2.8	11.2	0.6	3.6	0.4	22	40.5
37	F4-U03	166	<300	44.8	4.5	11.1	2.2	9.1	0.6	2.4	0.4	7	25.5
38	F4-U05	275	<300	56.7	6.2	12.1	2.4	12.1	0.9	4.2	0.7	1	58.5
39	F4-U06	395	<300	150.5	16.5	37.3	7.1	32.3	2.5	11.5	1.5	112	161.5
40	P1B-04	528	80	306	36.8	46.8	6.5	45	1.5	6.9	0.9	266	50
41	P2-300	1210	<300	632	76.2	114.5	15.9	84.8	3.2	16.3	1.8	73	110
42	P2-330	806	<300	412	53.4	110.5	16.2	63.1	3.3	18.1	2	66	91
43	P2-475	781	<300	334	39.4	68.4	9.6	47.1	1.9	10.3	1.3	54	36.5
44	P2-430	2040	300	1210	142.5	217	29.3	151.5	5	28	3.5	183	173
45	P2-480	548	<300	255	30.1	62.1	11.1	43	2.5	11.7	1.8	51	22.5
46	P3-380	869	<300	454	57.1	102	16.3	74.8	3.6	18.4	2.6	57	136.5
47	P3-470	2640	700	1965	257	500	80	335	15	66.1	8.6	485	359
48	P3-540	16.1	<100.0	6.8	0.3	3.2	<0.1	1.5	<0.1	0.5	<0.1	<1	1.5
49	P3-550	638	<300	345	42.4	85.2	15.1	56.8	3.4	18	2.4	42	43.5
50	MJVD-07N1	422	<400	183.5	17.5	54.9	10.1	32.8	2.4	11.1	1.3	57	83

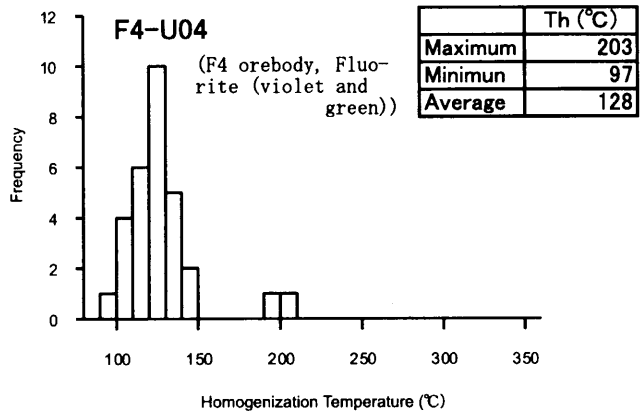
Apx. 4 Measurement results of fluid inclusion geothermometer

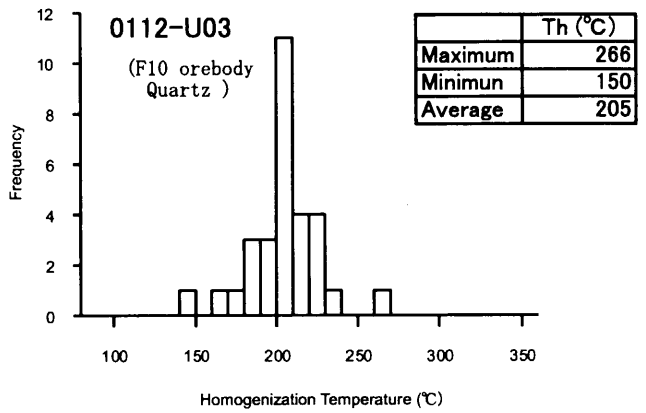


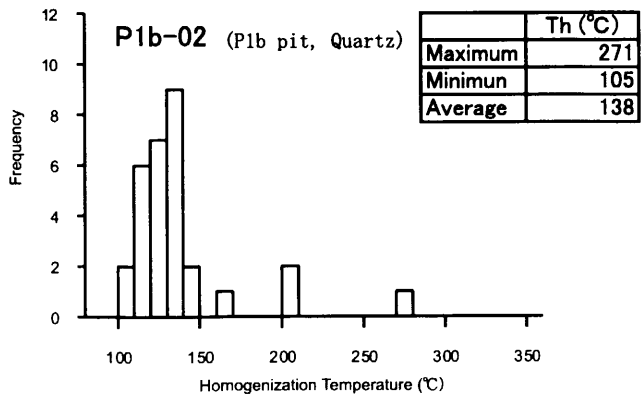












Histgram of homogenization temperature of fluid inclusions

No. 1
Sample No. 0104-U04 Easting
Northing

No.	Mineral	Th (℃)	Size	Position	Phase	Freezing point (℃)	NaCl (Wt%)
1	FI	112	5x10	I	S		
2	FI	117	15x20	I	S	-1.0	1.78
3	FI	120	20x30	I	S		
4	FI	115	15x20	I	P		
5	FI	141	10x10	I	P		
6	FI	184	20x30	I	P	-4.5	7.97
7	FI	265	5x10	I	P		
8	FI	258	5x10	I	P		
9	FI	300	10x20	I	S	-5.0	8.86
10	FI	246	15x15	I	P		
11	FI	257	15x20	I	P	-10.2	18.29
12	FI	255	10x20	I	P		
13	FI	120	5x10	I	S		
14	FI	116	5x10	I	S	-0.8	1.42
15	FI	133	10x20	I	S		
16	FI	144	20x30	I	P	-3.7	6.55
17	FI	242	10x15	I	P		
18	FI	258	15x20	I	P		
19	FI	263	5x10	I	P	-4.6	8.15
20	FI	288	5x15	I	P		
21	FI	114	15x20	I	S		
22	FI	122	10x20	I	P	-0.9	1.60
23	FI	259	5x10	I	P		
24	FI	261	10x20	I	P		
25	FI	292	15x20	I	S		
26	FI	334	20x30	I	P	-4.8	8.50
27	FI	104	20x30	I	S		
28	FI	121	10x20	I	P		
29	FI	251	5x10	I	P	-3.6	6.38
30	FI	260	10x20	I	P		

	Th (℃)
Maximum	334
Minimun	104
Average	202

No. 2
Sample No. P1b-01 Easting
Northing

No.	Mineral	Th (℃)	Size	Position	Phase	Freezing point (℃)	NaCl (Wt%)
1	FI	315	5x10	I	P	-9.4	16.80
2	FI	320	15x20	I	P		
3	FI	325	20x30	I	P	-10.3	18.47
4	FI	174	15x20	I	P		
5	FI	126	10x10	I	P		
6	FI	137	20x30	I	S		
7	FI	143	5x10	I	P	-3.6	
8	FI	297	5x10	I	P		
9	FI	306	10x20	I	P		
10	FI	336	15x15	I	P	-17.0	23.77
11	FI	357	15x20	I	P		
12	FI	316	10x20	I	P		
13	FI	324	5x10	I	P		
14	FI	354	5x10	I	P		
15	FI	330	10x20	I	P	-5.7	10.11
16	FI	330	20x30	I	P	-7.6	13.52
17	FI	135	10x15	I	S		
18	FI	141	15x20	I	P		
19	FI	297	5x10	I	P		
20	FI	300	5x15	I	P	-5.4	9.57
21	FI	323	15x20	I	P	-8.9	15.88
22	FI	331	10x20	I	P		
23	FI	317	5x10	I	P		
24	FI	322	10x20	I	P		
25	FI	344	15x20	I	P		
26	FI	136	20x30	I	P	-2.2	3.90
27	FI	312	20x30	I	P	-7.7	13.70
28	FI	327	10x20	I	P		
29	FI	341	5x10	I	P		
30	FI	328	10x20	I	P		

	Th (℃)
Maximum	357
Minimun	126
Average	281

Mineral (FI=fluorite, Qz=quartz)
Size (Widthμm×Lengthμm) Position (O=outsideoryouger, M=middle, I=innerorolder)
Phase (P=primary, S=secondary, PS=pseudosecondary)

No. 3
Sample No. P3-550 Easting
Northing

No.	Mineral	Th (℃)	Size	Position	Phase	Freezing point (℃)	NaCl (Wt%)
1	Qz	123	5x10	I	P	-1.4	2.5
2	Qz	151	3x5	I	P		
3	Qz	113	5x10	I	P	-4.0	7.1
4	Qz	174	5x5	I	S		
5	Qz	180	5x5	I	P		
6	Qz	106	3x5	I	P		
7	Qz	120	5x5	I	P		
8	Qz	127	5x10	I	P		
9	Qz	115	3x5	I	P		
10	Qz	220	5x10	I	P	-3.1	5.5
11	Qz	144	5x5	I	P	-1.2	2.1
12	Qz	194	3x5	I	P		
13	Qz	106	5x10	I	P		
14	Qz	110	5x5	I	S		
15	Qz	115	5x10	I	P		
16	Qz	115	5x5	I	S		
17	Qz	131	5x10	I	P	-5.2	9.2
18	Qz	162	5x10	I	P	-4.0	7.1
19	Qz	191	5x5	I	P		
20	Qz	133	3x5	I	P		
21	Qz	116	5x5	I	P		
22	Qz	120	5x5	I	P		
23	Qz	159	5x10	I	P	-3.8	6.7
24	Qz	122	5x5	I	S		
25	Qz	122	5x10	I	S	-0.5	0.9
26	Qz	130	3x5	I	P		
27	Qz	104	5x10	I	S	-3.6	6.4
28	Qz	126	3x5	I	P		
29	Qz	143	5x5	I	P		
30	Qz	136	5x10	I	P	-4.7	8.3

	Th (℃)
Maximum	220
Minimun	104
Average	137

No. 4
Sample No. MJVD-09-83.40 Easting
Northing

No.	Mineral	Th (℃)	Size	Position	Phase	Freezing point (℃)	NaCl (Wt%)
1	Fl	132	10x15	I	P		
2	Fl	115	10x20	I	P		
3	Fl	127	10x15	I	P	-0.3	0.5
4	Fl	131	5x10	I	P		
5	Fl	134	5x5	I	S		
6	Fl	120	10x20	I	P	-2.5	4.4
7	Fl	154	25x30	I	P		
8	Fl	202	10x15	I	P		
9	Fl	176	5x10	I	P		
10	Fl	107	5x10	I	P		
11	Fl	188	20x30	I	P	-4.1	7.3
12	Fl	122	10x20	I	P	-2.2	3.9
13	Fl	135	10x20	I	P		
14	Fl	134	5x10	I	P		
15	Fl	144	5x10	I	P		
16	Fl	118	5x5	I	S		
17	Fl	129	5x10	I	P		
18	Fl	125	5x10	I	P		
19	Fl	217	5x10	I	P		
20	Fl	119	5x5	I	P		
21	Fl	120	10x20	I	P	-1.5	2.7
22	Fl	103	20x30	I	P	-2.3	4.1
23	Fl	207	10x20	I	P	-4.8	8.5
24	Fl	126	5x10	I	P		
25	Fl	129	5x10	I	P		
26	Fl	133	5x10	I	P		
27	Fl	142	20x30	I	P	-2.0	3.5
28	Fl	145	10x20	I	P	-0.5	0.9
29	Fl	294	5x10	I	S		
30	Fl	137	10x20	I	P	-3.7	6.6

	Th (℃)
Maximum	294
Minimun	103
Average	146

Mineral (Fl=fluorite, Qz=quartz)
Size (Widthμm×Lengthμm) Position (O=outsideoryouger, M=middle, I=inneroroldeer)
Phase (P=primary, S=secondary, PS=pseudosecondary)

No. 5
Sample No. F4-U04 Easting
Northing

No.	Mineral	Th (℃)	Size	Position	Phase	Freezing point (℃)	NaCl (Wt%)
1	FI	146	5x10	I	P	-2.3	4.1
2	FI	118	5x10	I	S	-0.5	0.9
3	FI	123	10x15	I	P	-1.4	2.5
4	FI	122	10x15	I	P		
5	FI	97	5x10	I	S		
6	FI	107	5x5	I	P		
7	FI	125	5x5	I	P		
8	FI	116	10x20	I	P		
9	FI	138	10x30	I	P	-4.2	7.4
10	FI	104	5x5	I	P		
11	FI	117	5x10	I	P		
12	FI	126	5x10	I	P		
13	FI	126	5x10	I	P		
14	FI	109	5x10	I	P		
15	FI	142	10x20	I	P		
16	FI	121	5x10	I	P		
17	FI	114	10x20	I	P	-3.3	5.8
18	FI	197	15x25	I	P	-1.5	2.7
19	FI	103	5x5	I	P		
20	FI	115	5x10	I	P		
21	FI	134	10x10	I	P		
22	FI	127	10x20	I	P	-3.0	5.3
23	FI	119	5x10	I	S	-1.1	2.0
24	FI	121	5x10	I	P		
25	FI	133	5x5	I	P		
26	FI	133	5x5	I	P		
27	FI	203	10x20	I	P	-4.8	8.5
28	FI	134	10x10	I	P		
29	FI	128	5x10	I	P	-2.9	5.1
30	FI	130	5x10	I	P		

	Th (℃)
Maximum	203
Minimun	97
Average	128

No. 6
Sample No. 0112-U03 Easting
Northing

No.	Mineral	Th (℃)	Size	Position	Phase	Freezing point (℃)	NaCl (Wt%)
1	Qz	150	5x5	I	P		
2	Qz	184	5x10	I	P	-0.4	0.7
3	Qz	217	5x5	I	P		
4	Qz	194	5x10	I	P	-1.1	2.0
5	Qz	206	5x10	I	P	-0.6	1.1
6	Qz	202	5x5	I	P		
7	Qz	177	3x5	I	P		
8	Qz	202	5x5	I	P		
9	Qz	210	3x5	I	P		
10	Qz	221	5x10	I	P	-0.2	0.4
11	Qz	199	5x5	I	P		
12	Qz	216	5x5	I	P		
13	Qz	203	3x5	I	P		
14	Qz	182	3x5	I	P		
15	Qz	191	5x5	I	P		
16	Qz	205	3x5	I	P		
17	Qz	205	3x5	I	P		
18	Qz	217	5x5	I	P		
19	Qz	222	5x10	I	P	-2.3	4.1
20	Qz	201	5x5	I	P		
21	Qz	225	5x5	I	P		
22	Qz	166	5x5	I	P		
23	Qz	185	5x10	I	P	-0.8	1.4
24	Qz	206	5x10	I	P	-1.0	1.8
25	Qz	210	5x5	I	P		
26	Qz	210	3x5	I	P		
27	Qz	233	3x5	I	P		
28	Qz	266	5x10	I	P	-1.1	2.0
29	Qz	225	5x10	I	P	-3.0	5.3
30	Qz	220	5x10	I	P	-0.1	0.2

	Th (℃)
Maximum	266
Minimun	150
Average	205

Mineral (Ah=anhydrite, Ca=calcite, Ep=epidote, Gl=glass, Qz=quartz, Ze=zeolite, X=others)
Size (Widthμm×Lengthμm) Position (O=outsideoryouger, M=middle, I=innerorolder)
Phase (P=primary, S=secondary, PS=pseudosecondary)

No. 7
Sample No. P1b-02 Easting
Northing

No.	Mineral	Th (℃)	Size	Position	Phase	Freezing point (℃)	NaCl (Wt%)
1	FI	107	5x15	I	S		
2	FI	113	5x115	I	P		
3	FI	206	5x10	I	P		
4	FI	271	10x20	I	P	-0.6	1.1
5	FI	122	20x30	I	P	-1.2	2.1
6	FI	133	5x10	I	P		
7	FI	140	5x10	I	P		
8	FI	140	10x20	I	S	-0.2	0.4
9	FI	105	10x10	I	P		
10	FI	124	5x10	I	P		
11	FI	131	5x15	I	P	-2.7	4.8
12	FI	135	5x10	I	P		
13	FI	144	10x20	I	P		
14	FI	117	5x10	I	P		
15	FI	129	10x15	I	P	-3.4	6.0
16	FI	135	5x10	I	P		
17	FI	146	5x15	I	P		
18	FI	120	10x20	I	P		
19	FI	118	5x10	I	S		
20	FI	135	5x10	I	S	-0.9	1.6
21	FI	135	10x20	I	P	-2.7	4.8
22	FI	126	5x10	I	P		
23	FI	117	5x15	I	P		
24	FI	124	5x20	I	P		
25	FI	130	5x10	I	P	-4.0	7.1
26	FI	163	5x10	I	P	-2.2	3.9
27	FI	206	10x15	I	P		
28	FI	112	5x10	I	P		
29	FI	129	5x10	I	P		
30	FI	133	20x30	I	P	-1.5	2.7

	Th (℃)
Maximum	271
Minimun	105
Average	138

Mineral (FI=fluorite, Qz=quartz)
Size (Widthμm×Lengthμm) Position (O=outsideoryouger, M=middle, I=inneroroldер)
Phase (P=primary, S=secondary, PS=pseudosecondary)

Apx. 5 Photographs of hydrological working site in Dong Pao area

DW-1

DW-2

DW-3

DW-4

DW-4

Steam is rising from a doline

Cave-in on the paddy field

Circular paddy field around the cave

Apx. 6 Metrological observation system

Meteorological observation systems

Element	Sensor, Method of measurement	Range	Detection limit	Measuring interval	Measuring value	Remarks
Temperature	Platinum resistance temperature sensor	-40～+50 ℃	0.1 ℃	60 min.	Instantaneous value	Inside a vent sleeve
Humidity	Electrical capacitance thin film sensor	0～100 %	0.1 %	60 min.	Instantaneous value	Inside a vent sleeve
Precipitation	Tipping measure	1 bottle 0.5 mm (15.7cc)	0.5 mm	60 min.	Integrated value	Cylinder diameter 200mm
Wind direction	Tale of vane Potentiometer	0～360 deg.	1 deg.	60 min.	Instantaneous value	
Wind speed	3-cup anemometer Permanent magnet generator	2～50 m/s	0.1 m/s	60 min.	Instantaneous value	

Weather station

Weather station control unit (data logger)

Apx. 7 Vegetation study in Dong Pao area

I. List of common plants

1 LYCOPODIOPHYTA

1 Lycopodiaceae

1 *Lycopodium cernua* (L.) Fr. & Vasc.

Herbaceous Plant; terrestrial; strobile pendulous; sporophylls pale yellow; very common; edge of forest, on grassland and shrub; medecine plant.

2 EQULSOPHYTA

2 Equisetaceae

2 *Equisetum diffusum* D. Don

Herb plant; stem articulated; strobile terminal cylindric; humid edge of stream; ornamental plants.

3 POLYPODIOPHYTA

3 Aspleniaceae

3 *Asplenium nidus* L.

Epiphytic; frond to 1,2 m; sorus remote to margin; primary forest, village or on limestone forest; ornamental and medecine plant.

4 Blechnaceae

4 *Blechnum orientale* L. (Picture 1)

Herb. plant; frond 1−pinnate entir on margin; sorus along midrib; on shrub, grassland or edge of forest; vegetables, medecine plant.

5 Dennstaedtiaceae

5 *Pteridium aquilianum* (L.) Kuhn

Terrestrial fern; frond coriaceous; sorus marginal with double indusium; on grassland and shrub; vegetables, medecine plant.

6 Gleicheniaceae

6 *Dicranopteris linearis* (Burm. f.) Underw

Frond to 1 m high, pseudodichichotomous; on grassland, shrub or edge of forest; medecinal or fuel plant

4 ANGIOPSPERMAE

a Dicotyledones

7 Amaranthaceae

7 *Alternathera sessilis* (L.) A. DC

Ascending herb; glomerula white; on shrub; grassland or edge of limestone forest; vegetables, medecinal plant.

8 *Amaranthus spinosus* L.

Annual herb; terminal spikes; on shrub, grassland, edge of forest and village; vegetables and medecinal plant.

9 *Celosia argentea* L.

Annual herb; terminal spike of white or colored flower; on shrub, grassland, village; medecinal and ornamental plant.

8 Araliaceae

10 *Trevesia palmata* (Roxb. & Lindl.) Viss

Tree about 9 m high; leaves palmatipartite; in primary forest, edge of forest or on limestone forest; medecinal plant.

9 Bignoniaceae

10 *Stereospermum colais* (Dillw.) Mabb. (Picture 2)

Tree deciduous, 35 m high; flowers diurnal, white; primary forest or shrub; fiber trees.

10 Bombacaceae

11 *Bombax ceiba* L. (Picture 3)

Deciduous tree; 30 m high; red flower; primary forest, shrub or in village; medecinal or fiber plant.

11 Asteraceae

12 *Ageratum conyzoides* L. (Picture 4)

Common; violaceous or white capitulum; edge of forest, shrub, grassland, in village or bund of paddy field; medicinal or livestock feed plants.

13 *Blumea balsamifera* (L.) DC

Herb fragrant; 1−2 m high; capitulum yellow; shrub, grassland; village or dry field; medecinal plants.

14 *Eupatorium odoratum* L. (Picture 5)

Common weed; capitulum grayish; medecinal or green manure plants

15 *Gynura crepidoides* Benth. (Picture 6)

Common weed; flowers dark orange red; edge of forest, shrub, grassland or dry field;

vegetables or green manure plants.

12 Euphorbiaceae

16 *Phyllanthus reticulatus* Poir.

Shrub seldom tree; berries black; on shrub or edge of forest; medecinal or dye plants.

13 Lauraceae

16 *Litsea cubeba* (Lour.) Pers. (Picture 7)

Tree, 10 m high; braches black pubescent; leaves lemon scented; in primary forest or sbushy hills; firewood; oil plants

14 Fabaceae

17 *Cassia hirsuta* L.

Shrub plant; flower yellow; pods angulated; shrub, edge of forest and in village; medecinal and green manure plants.

15 Loganiaceae

18 *Gelsemium elegans* Benth.

Climber plant; flower yellow; in shrub; leaves very poisonous..

16 Malvaceae

19 *Sida rhombifolia* L.

Small shrub; leaves rhomboid; on shrub, grassland, edge of forest or in village; medecinal plants

20 *Urena lobata* L.

Shrub to 1 m high; leaves with rough hairs; flower pink; shrub, grassland, edge of forest or in village; medecinal plants

17 Melastomataceae

21 *Melastoma candidum* D. Don (Picture 8)

Shrub; calyx white tomentose; sepals red; on shrub or grassland; fuel plants.

18 Moraceae

22 *Ficus racemosa* L.

Tree to 30 m high; limb pubescent or tomentose; syconium red; primary forest, riverside forest; ornamental, vegetable plants or edible fruits.

23 *Streblus ilicifolius* (Vidal) Corner

Small tree; leaves coriaceous; on limestone forest; timber trees

24 *Streblus macrophyllus* Blume

Tree up to 15 m high; leaves glabrous; limestone forest; timber trees

19 Rosaceae

25 *Rubus alceaefolius* Poir.

Climber plant; leaves rufous pubescent; flower white; fruit red; on shrub, edge of forest or limestone forest; medecinal plants

20 Rubiaceae

26 *Mussaenda cambodiana* Pierre

Sarmentous; leaves finely pubescent; sepal white; shrub, edge of forest; medecinal plants

27 *Wendlandia glabrata* DC

Tree 4－6 m high; flower glabrous; primary forest or on shrubs; fiber trees

21 Rutaceae

28 *Euodia lepta* (Spreng.) Merr.

Shrub 2- 4 m high; leaflets lanceolate, glabrous; flower white; on shrub; medecinal plants

22 Solanaceae

29 *Solanum torvum* Sw.

Herb to 2 m high; limb gray villous; flower white; edge of forest or in village; medecinal plants

30 *Solanum annuum* L.

Annual plants; flower white; edge of forest; in village; spices and condiments

23 Theaceae

31 *Camellia sinensis* (U) Kuntze

Cultivated everywhere; bererages

32 *Schima wallichii* Choisy (Picture 9)

Tree up to 30 m high; trunk straight, cylindrical; in primary forest; wood brownish－red, rather good.

24 Urticaceae

33 *Laportea violacea* Gagnep.

Herb plant, 2 m high; limb with stinging short hair; inflorescence monnecious; limestone forest; plants producing poisons

25 Verbenaceae

34 *Clerodendrum philippinum* Schauer

Bush, 1, 5 m high; flower white; edge of forest; bush hills and village; medicinal plants.

b Monocotyledones

26 Alismataceae

35 *Alisma plantago－aquatica* L.

Limnophyte; stamens 6; paddy field; medecinal plants

36 *Sagittaria sagittaefolia* L.

Limnophyte; petals white; paddy and bund of field; vegetable and medecinal plants

27 Araceae

37 *Alocasia macrorrhizos* (L.) G. Don

Herb plant; limb peltate; edge of forest; medecinal and livestock feed plants

38 *Raphidophora decursiva* (Roxb.) Schott

Epiphytes; big climber; spathe yellow; primary forest and limestone forest; medecine plants.

28 Eriocaulaceae

39 *Eriocaulon nigrum* Lec.

Small tuft; capitulum 2- 3 mm, black; weed field.

29 Musaceae

40 *Musa acuminata* Colla (Picture 10)

Inflorescence horizontal or pendent, bracts revolute, open place of forest; livestock feed

30 Poaceae

41 *Bambusa bambos* (L.) Voss

Spinous to 25 m high bamboo; spikelets green; cultivated and wild

42 *Dendrocalamus brandisii* (Munro) Kurz

Stem 5 m high; spiklets 1,5 cm long; bamboo forest; vegetable (young tree), making baskets, mats and wickerwork.

43 *Dendrocalamus patellaris* Gamble
Bamboo to 8－10 m high; primary forest; vegetable and making baskets, mats and wickerwork.
44 *Gingantochloa leavis* (Blanco) Merr. (Picture 11)
Bamboo to 15 m high; spikelets 1,5 cm long; cultivated and wild; vegetable, making baskets, mats and wickerwork.
45 *Imperata cylindrica* (L.) P. Beauv
Common perennial weed; iflorescence white; edge of forest, bush hills and grassland; medicinal and thatching plants.
46 *Centotheca lappacea* (L.) Desv.
Perennial grass; edge of forest; livestock feed plant
47 *Setaria viridis* (L.) P. Beauv.
Perennial grass; inflorescence yellowish then green; grassland; livestock feed plant
48 *Saccharum spontneum* L. (Picture 12)
Perennial grass to 1,5 m high; edge of forest; grassland
49 *Thysanolaena maxima* (Roxb.) 0. Ktze. (Picture 13)
Perennial grass; 3 m high; ample panicles terminal; livestock feed and packing plants.

31 Palmae
50 *Arenga pinnata* (Wurmb) Merr.
Tree, leaves whitish beneath, drupes 4 cm wide; on limestone forest; starch producing and sugar plants.
51 *Garyota urens* L.
Tree to 15 m high; leaves 4m long; edge of forest; fiber and ornamental plants

32 Zingiberaceae
52 *Alpinia globosa* (Lour.) Hor.
Herb to 1 m high; labellum white red striated; primary forest; medecinal plants.
53 *Zingiber officinale* Roskoe
Geophyte to 1 m high; cultivated; medecinal plants.

II List of precious plants

Phylum: Angiosppermae

1.Fagaceae

1 *Castanopsis indica* A. DC.

Large tree, up to 25 m high; bark brownish－gray with dark gray traces; leaves simple, margin regularly serrated; primary forest; wood good quality. Used in construction and furniture making. Bark is rich in tannin.

2 Magnoliaceae

2 *Michelia balanse* (A. DC.) Dandy

Tree up to 15m;timber aromatic; in primary forest; used in expensive furniture and fine articlemaking.

3 *Paramichelia ballonii* (Pierre) Hu

Tree up to 30 m high. It is one of the precious woods of the genus Michelia; in primary forest.

3 Meliaceae

4 *Chukrasia tabularis* A. Jus

Tree up to 30 m. Wood hard and heavy, valuable. Used in construction and furniture making; in limestone forest. Under human influence at present time some young plants have seen in Dong Pao.

4 Rosaceae

5 *Prunus fordiana* Dunn.

Small tree, 10－15 m high; wood hard. Used in construction ship, boats, bridges and so on.

5 Polygonaceae

6 *Polygonum multiflorum* Thunb. (Picture 14)

Perennial limb; leaves cordiform; on bush hill or edge of limestone forest; precious medicinal plants.

6 Sapindaceae

7 *Pometia pinnata* Frost.

Tree up to 30 m high; base of tree usually with buttresses; in limestone forest; used for

boat-frames, africultural tools and implements, furniture.

7 Sapotaceae

8 *Madhuca pasquieri* H. Lec. (Picture 15)

Tree up to 30 -35 m high; timber very good, hard and heavy, used for furniture, piers, sleepers, ships; in primary forest.

8 Tiliaceae

9 *Burretiodendron hsienmu* Ching & Hu (Picture 16)

Tree up to 30 in high; trunk cylindrical, straight; wood very hard and heavy; can be used for furniture, in construction. Timber very valuable arid durable. In Dong Pao this species has become very rare. At present time a few trees can find on limestone forest.

III Vegetation types of Dong Pao Area

Although the diversity of vegetation types of Dong Pao area is not yet fully understands. We can give preliminary knowledge on the main types encountered.

A Primary forest (Picture 17, 18)

Primary forest was once widespread in this area. The area was heavily affected by human disturbance through selective logging. Due to extensive overexploitation and shifting cultivation. It can be found only in isolated and inaccessible steep valleys and steep slopes. Apart from that a long time ago local peoples have chosen some places cover primary forest near villages as cemetery. From year to year these places become sacred places, local peoples do not cut trees and they become protected area. The primary forest is characterized by large trees some almost reaching 30 m high. The most dominant in the upper canopy (20－30 m) were Fagaceae (Castanopsis, 1 species; Lithocarpus, 1 species); Fabaceae (Dalbergia, 1 species; Saraca, 1 species); Theaceae (Schima, 1 species); Bignoniaceae (Stereospermum, 1 species). The lower canopy layer consist mainly of Rosaceae (2 species), Rubiaceae (3 species), Araliaceae (1 species); Palmae (1 species). In ground layer there are a few herbaceous plans belonging to Poaceae grew. This type is found near village Ban Khoang, Na Khum, Ban Khum and Dong Pao.

B Secondary forest (Picture 19)

This type is derived from the primary forest by human disturbance through selective logging. This type is found near Na Khum. The most component of this forest is presence of Wendlandia (Rubiaceae); Macaranga, Mallotus (Euphorbiaceae). In the ground layer there are species belonging Poaceae (Imperata cylindrica; Digitaria dichotoma; Setaria viridis); Asteraceae (Blmea sp.; Eupatorium odoratum) and so on.

C Limestone forest (Picture 20)

This forest is characteristic for our country. It is found in mountainous province as Ha Giang, Tuyen Quang, Son La, Lai Chau, Bac Thai and so on. Limestone vegetation is very extremely diverse, especially because there are many communities, which are in different stages of succession. On limestone forest there are many precious plants. But living standard ethnic minorities very lowly. Therefore most of precious plants have exploited and area of this forest has reduced. In Dong Pao Area this forest were found near Ban Hon, Ban Tham and Dong Pao. It usually has two distinct tree layers with the

capoy 15－20 m tall although some bif trees can reach to 30 m. Buttresses and caulifory plants are relatively rare. This type forest has no found dominant species. In the first layer there are some species of Pometia pinnata (Sapindaceae); Burretiodendron hsienmu (Tiliaceae); Dalbergia sp (Fabaceae); Garcinia sp. (Clusiaceae). Second layer composed of species belonging Moraceae (Streblus macrophyllus, Streblus ilicifolius, Ficus sp.) Arenga pinnata (Palmae). Herb layer consists of Laportea violacea; Elastoma sp (Urticaceae); Acanthaceae; Rubiaceae and so on.

D Cultivated land

Rice, maize and Casava grow in terraced paddy field along the valley bottom slopes. During fallow period the fields dry and become overgrown with Setaria viridis; Eupatorium odoratum; Ageratum conyzoides on wet field we can find Alisma plantago －aqutica; Sagittaria sagittaefolia, Eriocaulon nigrum.

E Scrub Vegetation

Scrub is formed through human disturbance by conversion of the original forest to agricultural land or forest burning. This land is rotated for agricultural crops and after fallow some types of vegetation were established. This type consists of the follow communities:

a Dendrocalamus brandish - Imperata cylindrica community (Picture 21)

This community occurs on lower slopes. Dendrocalamus brandisii as a dominant in the upper layer. The ground layer consists of species belonging Poaceae and Cyperaceae.

b Litsea cubeba - Saccharumn spontaneum community (Picture 22)

This community occurs on lower slopes. Dendrocalamus brandisii and Saccharum spontaneum are dominant species. Some species can find in this community. They are Ageratum connyzoides; Melastoma candidum; Setaria viridis and so on.

1. *Blechnum orientale*

2. *Trevesia palmata*

3. *Bombax ceiba*

4. *Ageratum conyzoides*

5. *Eupatorium odoratum*

6. *Gynura crepidoides*

7. *Litsea cubeba*

8. *Melastoma candidum*

9. *Schima wallichii*

10. *Musa acuminata*

11. *Gingantochloa leavis*

12. *Saccharum spontneum*

13. *Thysanolaena maxima*

14. *Polygonum multiflorum*

15. *Madhuca pasquieri*

16. *Burretiodendron hsienmu*

17. Primary forest

18. Primary forest

19. Secondary forest

20. Limestone forest

21. *Dendrocalamus brandisii* - *Inperata cylindrica* community

22. *Litsea cubeba* - *Saccharum spontaneum* community

Apx. 8 (1)~(4) Drilling equipment of XY-2B, ckb-4 , ckb-4t3 and common equipment

Apx.8 (1/4) Drilling Equipment of XY-2B Machine

Equipment	Specification	MJVD-3	MJVD-7	MJVD-8	MJVD-9	MJVD-10	MJVD-13	Unit	Note
Drill machine	XY−2B	1	1	1	1	1	1	Set	Truck mount type
Drilling pump	Hb3−120/40T3	1	1	1	1	1	1	Set	
Derrick	6m	1	1	1	1	1	1	Set	Truck mount installed type
Drill rod	2-3/8″ 5m	16	20	20	20	20	16	Number	
Drill rod	2-3/8″ 1.0m	2	2	2	2	2	2	Number	
PQ core barrel	1.5m	1	1	1	1	1	1	Number	Single tyoe
PQ core barrel	1.5m	1	1	1	1	1	1	Number	Double type
PQ core barrel	1.5m	1	1	1	1	1	1	Number	Double type
Recovery casing pipe	ϕ146 3.0m	10	3	5	3	3		Number	OD:146mm, ID:134mm
Recovery casing pipe	ϕ108 3.0m	14	12		15			Number	OD:108mm, ID:96mm
Water suibell	3t	1	1	1	1	1	1	Number	
Hoisting	3t	1	1	1	1	1	1	Number	Simple type
Running block	5t	1	1	1	1	1	1	Number	
Tight grip wrench		3	3	3	3	3	3	Number	
Diamond coring bits	PQ	1	0.5	0.5	0.5	1	0.5	Number	Metal crown bits
Diamond coring bits	HQ	2	1	0.5	0.5	1	1.5	Number	Impregnated bits
Diamond reaming shell	PQ	1	1	0.5	0.5	1	1	Number	
Diamond reaming shell	HQ	1	1	0.5	0.5	1	0.5	Number	
Set of tools		1	1	1	1	1	1	Number	
Truck	IFAW50LA/A	1	1	1	1	1	1	Set	Made in China

Apx.8 (2/4) Drilling Equipment of ckb-4 Machine

Equipment	Specification	MJVD-1	MJVD-4	MJVD-5	MJVD-14	Unit	Note
Drill machine	ckb－4	1	1	1	1	Set	Truck mount type
Drilling pump	Hb3－120/40T3	1	1	1	1	Set	Truck mount type
Derrick	10m	1	1	1	1	Set	Truck mount type
Drill rod	2-3/8″ 5m	16	20	20	16	Number	
Drill rod	2-3/8″ 1.0m	2	2	2	2	Number	
PQ core barrel	1.5m	1	1	1	1	Number	Single tyoe
PQ core barrel	1.5m	1	1	1	1	Number	Double type
PQ core barrel	1.5m	1	1	1	1	Number	Double type
Recovery casing pipe	φ146 3.0m	5	14	7	4	Number	OD:146mm, ID:134mm
Recovery casing pipe	φ108 3.0m		10		9	Number	OD:108mm, ID:96mm
Water suibell	3t	1	1	1	1	Number	
Hoisting	3t	1	1	1	1	Number	Simple type
Running block	5t	1	1	1	1	Number	
Tight grip wrench		3	3	3	3	Number	
Diamond coring bits	PQ	1	1	1	1.5	Number	Metal crown bits
Diamond coring bits	HQ	1	1.5	2	1.5	Number	Impregnated bits
Diamond reaming shell	PQ	0	0	0	0	Number	
Diamond reaming shell	HQ	1	1.5	1	1.5	Number	
Set of tools		1	1	1	1	Number	
Truck	MA3	1	1	1	1	Set	Made in Russia

Apx. (3/4) Drilling Equipment of ckb-4t3Machine

Equipment	Specification	MJVD-2	MJVD-6	MJVD-11	MJVD-12	MJVD-15	MJVD-16	Unit	Note
Drill machine	ckb−4T3	1	1	1	1	1	1	Set	Truck mount type
Drilling pump	Hb3−160/63T3	1	1	1	1	1	1	Set	Truck mount type
Derrick	10m	1	1	1	1	1	1	Set	Truck mount type
Drill rod	2-3/8″ 5m	16	20	20	20	16	20	Number	
Drill rod	2-3/8″ 1.0m	2	2	2	2	2	2	Number	
PQ core barrel	1.5m	1	1	1	1	1	1	Number	Single tyoe
PQ core barrel	1.5m	1	1	1	1	1	1	Number	Double type
PQ core barrel	1.5m	1	1	1	1	1	1	Number	Double type
Recovery casing pipe	φ146 3.0m	7	28	14	2	6		Number	OD:146mm, ID:134mm
Recovery casing pipe	φ108 3.0m					28		Number	OD:108mm, ID:96mm
Water suibell	3t	1	1	1	1	1	1	Number	
Hoisting	3t	1	1	1	1	1	1	Number	Simple type
Running block	5t	1	1	1	1	1	1	Number	
Tight grip wrench		3	3	3	3	3	3	Number	
Diamond coring bits	PQ	1	1	0.5	1	0.5	0.5	Number	Metal crown bits
Diamond coring bits	HQ	1	3	0.5	0.5	0.5	0.5	Number	Impregnated bits
Diamond reaming shell	PQ	0	0	0	0	0	0.5	Number	
Diamond reaming shell	HQ	0.5	1	1	1	0.5	0	Number	
Set of tools		1	1	1	1	1	1	Number	
Truck	MA3	1	1	1	1	1	1	Set	Made in Russia

Apx. 8(4/4) Common Equipments

Equipment	Specification	Amount	Unit	Note
Mixing place				
Madmixer	600l	1	Set	
Generater	10KVA	1	Set	for lighting
Laying pipes	1-1/2″	300	m	Laying pipes for mad water
PVC pipes	1-1/2″	100	m	Laying pipes for mad water
Pumping place				
Pump for pumping-up	Hb3－120/40T3	1	Set	
Laying pipes	1-1/2″	200	m	for puming-up
PVC pipes	1-1/2″	100	m	for puming-up

Apx. 9 Amounts of consumed materials and diamond bits of drilling survey

Apx. 9 Amount of consumed materials and diamond bits of Drilling survey

Equipment	Specification	単位	MJVD-1	MJVD-2	MJVD-3	MJVD-4	MJVD-5	MJVD-6	MJVD-7	MJVD-8	MJVD-9	MJVD-10	MJVD-11	MJVD-12	MJVD-13	MJVD-14	MJVD-15	MJVD-16	Total
Coring bits	PQ metal crown bits	ケ	1	1	1	1	1	0.5	0.5	0.5	0.5	1	0.5	1	0.5	1.5	0.5	0.5	12.5
Coring bits	HQ Impregnated bits	ケ	1	1	2	1.5	2	0.5	1	0.5	0.5	1	0.5	0.5	1.5	1.5	0.5	0.5	16
Reaming shell	PQ	ケ	0	0	1	0	0	0.5	1	0.5	0.5	1	0	0	1	0	0	0	5.5
Reaming shell	HQ	ケ	1	0.5	1	1.5	1	0.5	1	0.5	0.5	1	1	1	0.5	1.5	0.5	0.5	13.5
Casing	φ146mm 3.0m	本	5	7	10	8	8		3	5	3	3		2	2	4	3	2	65
Casing	φ108mm 3.0m				14	10	0	29	12		15		14		5	8	14	10	131
Bentonite		kg	2,000	2,500	1,500	3,000	1,500	1,500	2,200	2,000	3,000	3,000	1,500	2,000	3,500	2,500	2,000	1,500	35200
C. M. C		kg	4	3	2.5	7	3	3	4	4	5	3	3	4	5	4	3	3	60.5
Slaked lime		kg	4	3	2.5	7	3	3	4	4	5	3.5	3	4	5	4	3	3	61
Gas oil		l	300	200	450	500	400	400	300	250	250	250	400	300	200	250	200	200	4850
Engine oil		l	3	2	4	5	4	4	3	2	2	2	4	3	2	3	2	2	47

Apx. 10 (1)~(16)　Drilling progress results (MJVD-1~16)

Apx. 10 (1) Drilling progress results of drill hole MJVD -1

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 24	0.5	0.5	0	
Drilling	Dec. 24 - Dec.29	6.5	6.5	0	
Demobilization	Dec.30	1.0	1.0	0	
Total		8.0	8.0	0	28
Planned depth	80m				
Drilled depth	80m				
Core length	74.68				
Core recovery	93.35%				
Casing 146mm	13.5m				
Casing 108mm	0m				
Drilling speed	12.3m/Drilling day				

Apx. 10 (2) Drilling progress results of drill hole MJVD -2

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 30	0.5	0.5	0	
Drilling	Dec. 30 -Jan. 2	3.0	3.0	0	
Demobilization	Jan. 3	0.5	0.5	0	
Total		4.0	4.0	0	29.2
Planned depth	80m				
Drilled depth	80m				
Core length	75.80m				
Core recovery	94.75%				
Casing 146mm	20m				
Casing 108mm	0m				
Drilling speed	26.7m/Drilling day				

Apx. 10 (3) Drilling progress results of drill hole MJVD -3

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 7	0.5	0.5	0	
Drilling	Dec. 7- Dec. 15	8.5	8.5	0	
Demobilization	Dec. 15	0.5	0.5	0	
Total		9.5	9.5	0	22
Planned depth	80m				
Drilled depth	80m				
Core length	65.6m				
Core recovery	82.00%				
Casing 146mm	31.3m				
Casing 108mm	41.95m				
Drilling speed	9.4m/Drilling day				

Apx.10 (4) Drilling progress results of drill hole MJVD -4

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 15	0.5	0.5	0	
Drilling	Dec. 15 - Dec. 24	9.0	9.0	0	
Demobilization	Dec. 24	0.5	0.5	0	
Total		10.0	10.0	0	23.2
Planned depth	100m				
Drilled depth	100m				
Core length	96.80m				
Core recovery	96.80%				
Casing 146mm	23.30m				
Casing 108mm	29.45m				
Drilling speed	11.0m/Drilling day				

Apx. 10 (5) Drilling progress results of drill hole MJVD -5

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 6	1	1	0	
Drilling	Dec. 7 - Dec. 14	7.5	7.5	0	
Demobilization	Dec. 14	0.5	0.5	0	
Total		9.0	9.0	0	21.7
Planned depth	100m				
Drilled depth	100m				
Core length	95.68m				
Core recovery	95.68%				
Casing 146mm	22.3m				
Casing 108mm	0m				
Drilling speed	13.3m/Drilling day				

Apx. 10 (6) Drilling progress results of drill hole MJVD -6

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 6	1.0	1.0	0	
Drilling	Dec. 7 - Dec.14	7.5	7.5	0	
Demobilization	Dec.14	0.5	0.5	0	
Total		9.0	9.0	0	22.6
Planned depth	100m				
Drilled depth	100m				
Core length	94.35m				
Core recovery	94.35%				
Casing 146mm	0m				
Casing 108mm	85m				
Drilling speed	13.3m/Drilling day				

Apx. 10 (7) Drilling progress results of drill hole MJVD -7

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 16	0.5	0.5	0	
Drilling	Dec. 16 - Dec. 21	5.0	5.0	0	
Demobilization	Dec. 21	0.5	0.5	0	
Total		6.0	6.0	0	22
Planned depth	100m				
Drilled depth	100m				
Core length	89.00m				
Core recovery	89.00%				
Casing 146mm	10m				
Casing 108mm	37.15m				
Drilling speed	20.0m/Drilling day				

Apx. 10 (8) Drilling progress results of drill hole MJVD -8

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 31	0.5	0.5	0	
Drilling	Dec. 31 - Jan. 3	3.0	3.0	0	
Demobilization	Jan. 3	0.5	0.5	0	
Total		4.0	4.0	0	26.2
Planned depth	100m				
Drilled depth	100m				
Core length	97.80m				
Core recovery	97.80%				
Casing 146mm	15m				
Casing 108mm	0m				
Drilling speed	33.3m/Drilling day				

Apx. 10 (9) Drilling progress results of drill hole MJVD -9

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 26	0.5	0.5	0	
Drilling	Dec. 26 - Dec. 30	4.0	4.0	0	
Demobilization	Dec. 30	0.5	0.5	0	
Total		5.0	5.0	0	
Planned depth	100m				
Drilled depth	100m				
Core length	93.70m				
Core recovery	93.70%				
Casing 146mm	10m				
Casing 108mm	45m				
Drilling speed	25.0m/Drilling day				

Apx. 10 (10) Drilling progress results of drill hole MJVD -10

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 22	0.5	0.5	0	
Drilling	Dec. 22 - Dec. 27	5.0	5.0	0	
Demobilization	Dec. 27	0.5	0.5	0	
Total		6.0	6.0	0	23.5
Planned depth	100m				
Drilled depth	100m				
Core length	94.9m				
Core recovery	94.90%				
Casing 146mm	10m				
Casing 108mm	0m				
Drilling speed	20.0m/Drilling day				

Apx. 10 (11) Drilling progress results of drill hole MJVD -11

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 20	0.5	0.5	0	
Drilling	Dec. 20 - Dec. 27	7.0	7.0	0	
Demobilization	Dec. 27	0.5	0.5	0	
Total		8.0	8.0	0	26
Planned depth	100m				
Drilled depth	100m				
Core length	95.50m				
Core recovery	95.50%				
Casing 146mm	0m				
Casing 108mm	41.2m				
Drilling speed	14.3m/Drilling day				

Apx. 10 (12) Drilling progress results of drill hole MJVD -12

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 15	0.5	0.5	0	
Drilling	Dec. 15 - Dec. 20	5.0	5.0	0	
Demobilization	Dec. 20	0.5	0.5	0	
Total		6.0	6.0	0	22.8
Planned depth	100m				
Drilled depth	100m				
Core length	95.80m				
Core recovery	95.80%				
Casing 146mm	5.0m				
Casing 108mm	0mm				
Drilling speed	20.0m/Drilling day				

Apx. 10 (13) Drilling progress results of drill hole MJVD -9

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Jan. 4	0.5	0.5	0	
Drilling	Jan. 4 - Jan.8	4.0	4.0	0	
Demobilization	Jan. 8	0.5	0.5	0	
Total		5.0	5.0	0	29.7
Planned depth	80m				
Drilled depth	80m				
Core length	76.6m				
Core recovery	95.75%				
Casing 146mm	5m				
Casing 108mm	15m				
Drilling speed	20.0m/Drilling day				

Apx. 10 (14) Drilling progress results of drill hole MJVD -14

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 30	0.5	0.5	0	
Drilling	Dec. 30 - Jan. 3	4.5	4.5	0	
Demobilization	Jan. 4	1.0	1.0	0	
Total		6.0	6.0	0	28.1
Planned depth	80m				
Drilled depth	80m				
Core length	75.6m				
Core recovery	94.50%				
Casing 146mm	12m				
Casing 108mm	26.1m				
Drilling speed	17.8m/Drilling day				

Apx. 10 (15) Drilling progress results of drill hole MJVD -15

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Dec. 27	0.5	0.5	0	
Drilling	Dec. 27 - Dec.30	3.0	3.0	0	
Demobilization	Dec. 30	0.5	0.5	0	
Total		4.0	4.0	0	27.6
Planned depth	80m				
Drilled depth	80m				
Core length	75.85m				
Core recovery	94.81%				
Casing 146mm	0m				
Casing 108mm	41.2m				
Drilling speed	26.6m/Drilling day				

Apx. 10 (16) Drilling progress results of drill hole MJVD -16

	Period	Number of days	Working days	Off work days	Number. of Workers
Mobilization	Jan. 3	0.5	0.5	0	
Drilling	Jan. 3 - Jan. 6	3.0	3.0	0	
Demobilization	Jan. 6	0.5	0.5	0	
Total		4.0	4.0	0	31.2
Planned depth	100m				
Drilled depth	100m				
Core length	93.4m				
Core recovery	93.40%				
Casing 146mm	5m				
Casing 108mm	30m				
Drilling speed	33.3m/Drilling day				