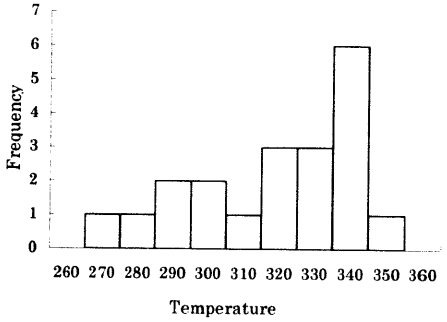
Appendix-10

Homogenization temperature and salinity of fluid inclusions of quartz samples (1/13)

Sample A00NK013

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	37.5	17	tu	341	183.0	30.9
2	Quartz	12.5	15	po	347	192.0	31.4
3	Quartz	10.0	15	po	296	234.0	33.5
4	Quartz	10.0	15	po	288	211.0	32.4
5	Quartz	17.5	13	po	306	243.0	34.1
6	Quartz	30.0	13	po	352	225.0	32.9
7	Quartz	17.5	13	po	279	195.0	31.4
8	Quartz	22.5	15	tu	337	201.0	31.9
9	Quartz	15.0	15	po	327	214.0	32.4
10	Quartz	7.5	13	po	343	222.0	32.9
11	Quartz	7.5	13	po	313	225.0	32.9
12	Quartz	22.5	17	tu	325	194.0	31.4
13	Quartz	17.5	17	wg	344	199.0	31.4
14	Quartz	5.0	15	po	335	228.0	32.9
15	Quartz	10.0	15	po	341	204.0	31.9
16	Quartz	7.5	13	po	327	221.0	32.9
17	Quartz	17.5	17	po	338	235.0	33.5
18	Quartz	17.5	15	tu	343	195.0	31.4
19	Quartz	10.0	13	po	303	223.0	32.9
20	Quartz	7.5	13	po	295	201.0	31.9

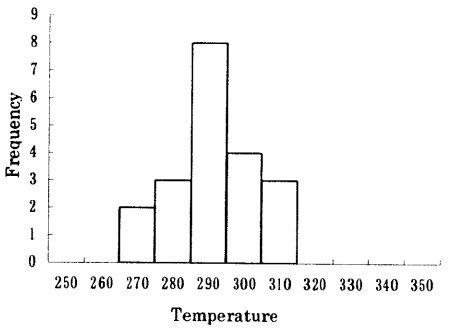


Mineral	Quartz
Inclusions	20
Maximum	352 ℃
Minimum	279 ℃
Average	324.0 ℃
deviation	21.6

Homogenization temperature and salinity of fluid inclusions of quartz samples (2/13)

Sample A00NK038

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	7.5	15	wg	291	-0.4	0.71
2	Quartz	5.0	15	po	305	-0.4	0.71
3	Quartz	2.5	13	po	282		
4	Quartz	< 2.5	12	po	273		
5	Quartz	< 2.5	10	eg	275		
6	Quartz	10.0	17	po	311	-0.3	0.53
7	Quartz	5.0	15	po	302	-0.4	0.71
8	Quartz	5.0	17	sq	295	-0.2	0.35
9	Quartz	5.0	17	sq	297	-0.2	0.35
10	Quartz	5.0	15	po	303	-0.4	0.71
11	Quartz	2.5	12	po	292		
12	Quartz	< 2.5	10	po	296		
13	Quartz	< 2.5	10	eg	280		
14	Quartz	< 2.5	10	eg	291		
15	Quartz	7.5	15	po	303	-0.2	0.35
16	Quartz	7.5	13	po	312	-0.5	0.88
17	Quartz	5.0	12	po	292	-0.4	0.71
18	Quartz	5.0	15	sq	310	-0.2	0.35
19	Quartz	< 2.5	12	eg	295		
20	Quartz	< 2.5	10	eg	287		



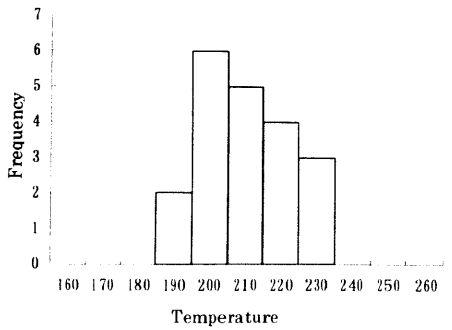
Mineral	Quartz
Inclusions	20
Maximum	312 ℃
Minimum	273 ℃
Average	294.6 ℃
deviation	11.0

Appendix-10

Homogenization temperature and salinity of fluid inclusions of quartz samples (3/13)

Sample A00MZ012

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	25.0	15	irr	225	-2.1	3.55
2	Quartz	10.0	13	irr	193	-2.1	3.55
3	Quartz	7.5	13	irr	206	-1.9	3.23
4	Quartz	22.5	15	irr	219	-2.4	4.03
5	Quartz	20.0	17	po	223	-2.1	3.55
6	Quartz	10.0	13	irr	208	-2.2	3.71
7	Quartz	15.0	13	irr	214	-2.1	3.55
8	Quartz	17.5	15	irr	231	-2.4	4.03
9	Quartz	5.0	13	po	223		
10	Quartz	5.0	12	po	214		
11	Quartz	22.5	15	irr	204	-2.2	3.71
12	Quartz	17.5	15	irr	197	-2.1	3.55
13	Quartz	17.5	13	irr	202	-2.1	3.55
14	Quartz	10.0	12	po	201	-2.1	3.55
15	Quartz	7.5	15	po	235		
16	Quartz	5.0	13	po	215		
17	Quartz	5.0	13	po	223		
18	Quartz	12.5	15	wg	232	-2.2	3.71
19	Quartz	5.0	13	po	219		
20	Quartz	5.0	12	po	205		

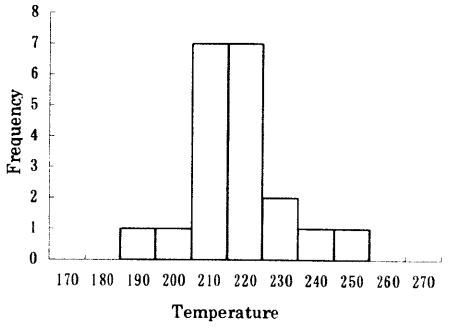


Mineral	Quartz
Inclusions	20
Maximum	235 ℃
Minimum	193 ℃
Average	214.5 ℃
deviation	11.8

Homogenization temperature and salinity of fluid inclusions of quartz samples (4/13)

Sample A00MZ016

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	27.5	15	irr	223	-3.1	5.11
2	Quartz	10.0	10	po	215	-3.2	5.26
3	Quartz	17.5	10	po	213	-2.7	4.49
4	Quartz	7.5	10	po	216	-3.2	5.26
5	Quartz	7.5	12	po	227	-3.3	5.41
6	Quartz	20.0	13	po	233	-2.6	4.34
7	Quartz	25.0	20	po	253	-3.0	4.96
8	Quartz	12.5	12	irr	221	-2.2	3.71
9	Quartz	10.0	10	irr	208	-1.8	3.06
10	Quartz	7.5	10	po	220		
11	Quartz	7.5	17	po	245		
12	Quartz	17.5	13	irr	226	-2.2	3.71
13	Quartz	25.0	12	irr	228	-3.4	5.56
14	Quartz	10.0	10	tu	198	-2.5	4.18
15	Quartz	7.5	10	po	213		
16	Quartz	7.5	10	po	212		
17	Quartz	10.0	12	po	228	-2.8	4.65
18	Quartz	32.5	13	irr	215	-3.3	5.41
19	Quartz	17.5	15	po	237	-3.2	5.26
20	Quartz	12.5	13	po	213	-2.7	4.49



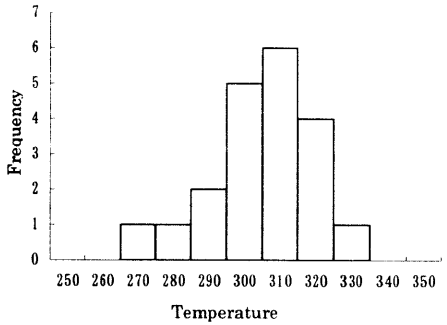
Mineral	Quartz
Inclusions	20
Maximum	253 ℃
Minimum	198 ℃
Average	222.2 ℃
deviation	12.7

Appendix-10

Homogenization temperatura and salinity of fluid inclusions of quartz samples (5/13)

Sample A00MZ017

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	37.5	15	po	313	-3.0	4.96
2	Quartz	55.0	13	irr	272	-2.1	3.55
3	Quartz	7.5	15	po	308	-0.3	5.26
4	Quartz	7.5	13	po	295	-2.6	4.34
5	Quartz	7.5	13	po	331	-2.6	4.34
6	Quartz	12.5	17	po	311	-3.0	4.96
7	Quartz	2.5	17	po	283		
8	Quartz	12.5	13	po	315	-1.9	3.23
9	Quartz	5.0	13	po	326		
10	Quartz	5.0	13	po	314		
11	Quartz	15.0	15	irr	301	-2.0	3.39
12	Quartz	12.5	17	sq	328	-2.5	4.18
13	Quartz	7.5	15	sq	304	-2.8	4.65
14	Quartz	5.0	13	po	313		
15	Quartz	32.5	13	irr	320	-3.1	5.11
16	Quartz	20.0	13	irr	321	-1.8	3.06
17	Quartz	12.5	13	po	295	-2.5	4.18
18	Quartz	10.0	12	po	304	-2.7	4.49
19	Quartz	7.5	12	po	307		
20	Quartz	10.0	13	po	313	-2.8	4.65

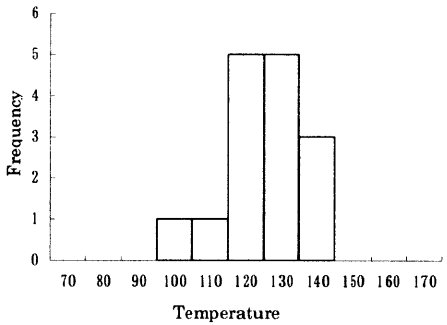


Mineral	Quartz
Inclusions	20
Maximum	331 ℃
Minimum	272 ℃
Average	308.7 ℃
deviation	14.3

Homogenization temperatura and salinity of fluid inclusions of quartz samples (6/13)

Sample A00MZ043

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	12.5	10	irr	128	-0.9	1.57
2	Quartz	5.0	10	irr	109	-1.0	1.74
3	Quartz	< 2.5	7	po	127		
4	Quartz	< 2.5	7	eg	134		
5	Quartz	< 2.5	10	eg	141		
6	Quartz	7.5	12	po	144	-1.2	2.07
7	Quartz	5.0	10	po	136	-1.3	2.24
8	Quartz	5.0	10	irr	122	-0.9	1.57
9	Quartz	2.5	7	po	121		
10	Quartz	< 2.5	7	po	133		
11	Quartz	5.0	10	irr	140	-0.8	1.40
12	Quartz	5.0	7	irr	133	-1.4	2.41
13	Quartz	5.0	7	irr	136	-0.9	1.57
14	Quartz	< 2.5	7	po	129		
15	Quartz	< 2.5	5	eg	117		



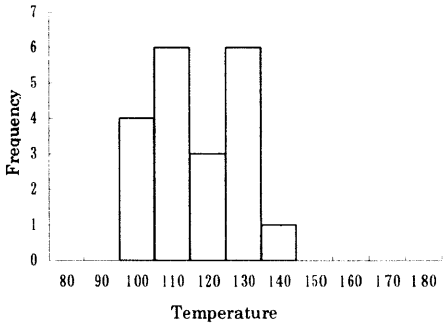
Mineral	Quartz
Inclusions	15
Maximum	144 ℃
Minimum	109 ℃
Average	130.0 ℃
deviation	9.3

Appendix-10

Homogenization temperatura and salinity of fluid inclusions of quartz samples (7/13)

Sample A00MZ046

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	12.5	10	po	106	-1.6	2.74
2	Quartz	10.0	12	po	112	-1.8	3.06
3	Quartz	5.0	10	po	130		
4	Quartz	5.0	7	po	105		
5	Quartz	7.5	12	po	141	-1.2	2.07
6	Quartz	10.0	12	wg	136	-0.7	1.23
7	Quartz	12.5	12	wg	132	-1.4	2.41
8	Quartz	5.0	10	po	124		
9	Quartz	5.0	10	po	117		
10	Quartz	7.5	12	po	132	-1.5	2.57
11	Quartz	10.0	10	wg	135	-1.2	2.07
12	Quartz	7.5	7	po	109	-1.2	2.07
13	Quartz	17.5	10	irr	115	-1.0	1.74
14	Quartz	12.5	12	irr	121	-0.8	1.40
15	Quartz	5.0	10	po	114		
16	Quartz	5.0	7	po	113		
17	Quartz	10.0	12	po	138	-1.3	2.24
18	Quartz	7.5	10	po	122	-1.7	2.90
19	Quartz	5.0	10	po	112	-1.4	2.41
20	Quartz	5.0	7	po	107		

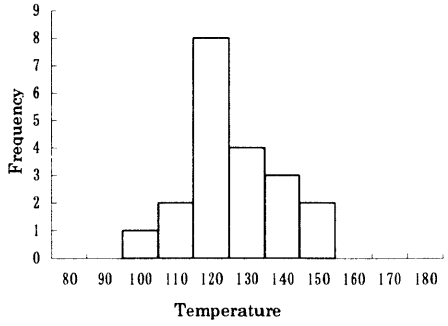


Mineral	Quartz
Inclusions	20
Maximum	141 ℃
Minimum	105 ℃
Average	121.1 ℃
deviation	11.4

Homogenization temperatura and salinity of fluid inclusions of quartz samples (8/13)

Sample A00MZ048

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	10.0	12	po	135	-0.8	1.40
2	Quartz	5.0	10	po	127	-1.1	1.91
3	Quartz	5.0	13	sq	145	-0.2	0.35
4	Quartz	2.5	10	po	119		
5	Quartz	< 2.5	10	po	123		
6	Quartz	< 2.5	7	eg	108		
7	Quartz	12.5	12	po	137	-0.9	1.57
8	Quartz	7.5	12	po	152	-0.8	1.40
9	Quartz	7.5	10	po	137	-0.6	1.05
10	Quartz	5.0	10	sq	142	-0.8	1.40
11	Quartz	2.5	7	po	125		
12	Quartz	< 2.5	10	eg	153		
13	Quartz	< 2.5	7	eg	129		
14	Quartz	12.5	15	irr	117	-0.8	1.40
15	Quartz	10.0	10	sq	143	-1.0	1.74
16	Quartz	5.0	12	po	125	-0.8	1.40
17	Quartz	5.0	10	po	121		
18	Quartz	5.0	10	po	123	-0.8	1.40
19	Quartz	< 2.5	10	po	135		
20	Quartz	< 2.5	7	eg	122		



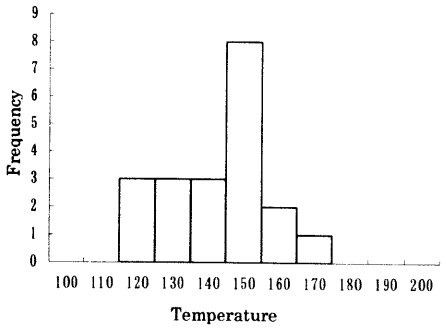
Mineral	Quartz
Inclusions	20
Maximum	153 ℃
Minimum	108 ℃
Average	130.9 ℃
deviation	11.7

Appendix-10

Homogenization temperatura and salinity of fluid inclusions of quartz samples (9/13)

Sample A00MZ051

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	12.5	12	irr	142	-0.4	0.71
2	Quartz	10.0	10	irr	121	-0.1	0.18
3	Quartz	5.0	13	po	155	-0.6	1.05
4	Quartz	5.0	12	po	132		
5	Quartz	5.0	10	po	124		
6	Quartz	7.5	12	irr	127	-0.6	1.05
7	Quartz	5.0	12	po	157	-0.5	0.88
8	Quartz	< 2.5	10	po	143		
9	Quartz	5.0	15	sq	167	-0.3	0.53
10	Quartz	5.0	13	po	157	-0.2	0.35
11	Quartz	5.0	12	po	138	-0.2	0.35
12	Quartz	10.0	12	wg	155	-0.3	0.53
13	Quartz	7.5	13	po	152	-0.6	1.05
14	Quartz	5.0	12	po	145	-0.8	1.40
15	Quartz	5.0	12	po	161	-0.3	0.53
16	Quartz	5.0	17	sq	173	-0.2	0.35
17	Quartz	5.0	12	po	155		
18	Quartz	2.5	10	po	132		
19	Quartz	< 2.5	7	eg	150		
20	Quartz	5.0	12	po	158	-0.3	0.53

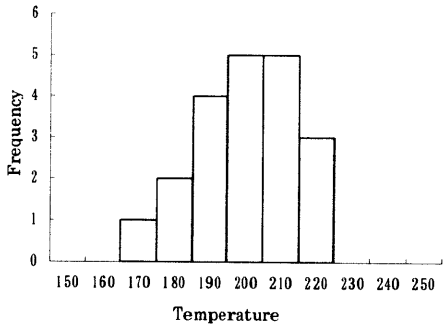


Mineral	Quartz
Inclusions	20
Maximum	173 ℃
Minimum	121 ℃
Average	147.2 ℃
deviation	14.1

Homogenization temperatura and salinity of fluid inclusions of quartz samples (10/13)

Sample A00MZ066

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	10.0	15	po	195	-1.4	2.41
2	Quartz	7.5	15	po	203	-1.6	2.74
3	Quartz	7.5	13	po	211	-1.3	2.24
4	Quartz	5.0	12	sq	209	-1.3	2.24
5	Quartz	5.0	13	sq	223		
6	Quartz	10.0	15	irr	180	-1.5	2.57
7	Quartz	5.0	15	po	203	-1.7	2.90
8	Quartz	2.5	10	po	191		
9	Quartz	< 2.5	10	po	194		
10	Quartz	< 2.5	7	eg	177		
11	Quartz	12.5	13	po	221	-1.3	2.24
12	Quartz	10.0	12	po	215	-1.2	2.07
13	Quartz	5.0	10	sq	201		
14	Quartz	5.0	13	sq	215		
15	Quartz	7.5	12	po	213	-1.5	2.57
16	Quartz	12.5	12	po	195	-1.9	3.23
17	Quartz	10.0	13	sq	222	-1.4	2.41
18	Quartz	5.0	12	po	213		
19	Quartz	5.0	12	po	207		
20	Quartz	7.5	10	po	183	-1.2	2.07



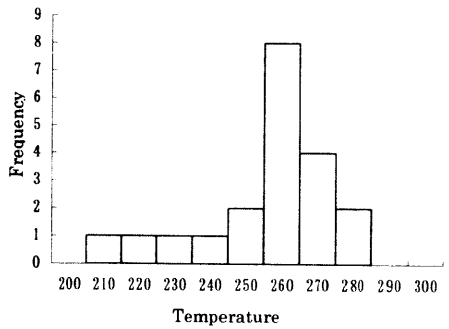
Mineral	Quartz
Inclusions	20
Maximum	223 ℃
Minimum	177 ℃
Average	203.6 ℃
deviation	13.5

Appendix-10

Homogenization temperatura and salinity of fluid inclusions of quartz samples (11/13)

Sample A00TM039

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	12.5	17	po	224	161.0	30.1
2	Quartz	12.5	15	po	265	125.0	28.6
3	Quartz	10.0	20	po	275	166.0	30.1
4	Quartz	10.0	17	po	253	131.0	28.9
5	Quartz	10.0	20	po	277	165.0	30.1
6	Quartz	5.0	20	sq	283	172.0	30.5
7	Quartz	5.0	17	sq	275	177.0	30.5
8	Quartz	7.5	20	po	281	135.0	28.9
9	Quartz	7.5	17	po	263	125.0	28.6
10	Quartz	5.0	13	po	242	117.0	28.3
11	Quartz	12.5	13	irr	215	182.0	30.9
12	Quartz	10.0	17	po	261	131.0	28.9
13	Quartz	7.5	15	irr	237	177.0	30.5
14	Quartz	5.0	15	po	262		
15	Quartz	5.0	13	po	251	125.0	28.6
16	Quartz	10.0	15	po	262	163.0	30.1
17	Quartz	7.5	20	sq	266	152.0	29.7
18	Quartz	10.0	17	wg	263	164.0	30.1
19	Quartz	7.5	17	po	261	162.0	30.1
20	Quartz	7.5	20	po	273		

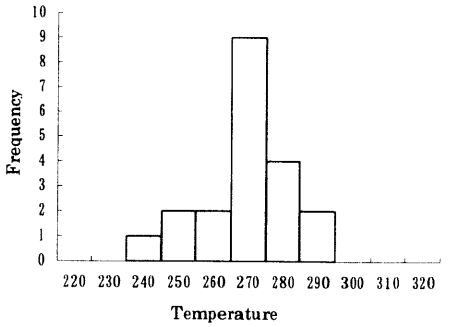


Mineral	Quartz
Inclusions	20
Maximum	283 ℃
Minimum	215 ℃
Average	259.5 ℃
deviation	17.7

Homogenization temperatura and salinity of fluid inclusions of quartz samples (12/13)

Sample A00TM042

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	27.5	13	irr	276	-2.5	4.18
2	Quartz	7.5	13	po	241	-1.2	2.07
3	Quartz	32.5	15	irr	279	-2.0	3.39
4	Quartz	20.0	13	po	251	-3.4	5.56
5	Quartz	22.5	17	irr	270	-3.2	5.26
6	Quartz	17.5	17	irr	271	-2.2	3.71
7	Quartz	12.5	20	po	288	-1.5	2.57
8	Quartz	10.0	17	po	267	-1.7	2.90
9	Quartz	10.0	20	po	282	-2.0	3.39
10	Quartz	5.0	13	po	255		
11	Quartz	17.5	20	irr	289	-2.7	4.49
12	Quartz	10.0	17	po	274	-2.8	4.65
13	Quartz	7.5	20	po	295		
14	Quartz	7.5	17	po	275		
15	Quartz	12.5	17	po	291	-3.0	4.96
16	Quartz	40.0	20	irr	283	-1.3	2.24
17	Quartz	22.5	17	irr	275	-1.5	2.57
18	Quartz	10.0	17	po	279	-2.2	3.71
19	Quartz	5.0	15	po	260		
20	Quartz	12.5	17	po	271	-2.1	3.55



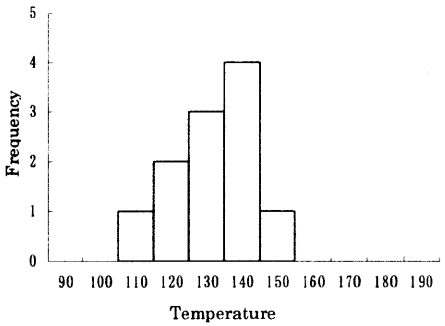
Mineral	Quartz
Inclusions	20
Maximum	295 ℃
Minimum	241
Average	273.6 ℃
deviation	13.4

Appendix-10

Homogenization temperatura and salinity of fluid inclusions of quartz samples (13/13)

Sample A00TM059

No.	Mineral	Size (mμ)	Volume ratio (%)	Form	Temperature (℃)	Melting Temperature (℃)	NaCl Wt (%)
1	Quartz	5.0	13	po	145	-0.8	1.40
2	Quartz	5.0	12	po	132	-0.9	1.57
3	Quartz	2.5	10	po	147		
4	Quartz	< 2.5	7	po	124		
5	Quartz	< 2.5	10	eg	143		
6	Quartz	< 2.5	7	eg	121		
7	Quartz	< 2.5	7	eg	119		
8	Quartz	5.0	12	po	135	-0.4	0.71
9	Quartz	< 2.5	10	eg	151		
10	Quartz	< 2.5	7	eg	144		
11	Quartz	< 2.5	7	eg	132		



Mineral	Quartz
Inclusions	11
Maximum	151 ℃
Minimum	119 ℃
Average	135.7 ℃
deviation	10.6

Legend of Form

eg:egg shape; irr:irregular; po:polygon; sq:square; tr:triangle; tu:tube; wg:wedge-shape

Appendix-11 Measurement results of sulfur isotopic composition.

No.	Sample No.	District	Locality	Type	δ 34S (‰)
1	A00MZ012	Andacollo	Mina Sofia, Level1	Pyrite in quartz vein	+3.5
2	A00MZ014	Andacollo	Mina Sofia	Pyrite in black mudstone	-14.9
3	A00MZ029	Mina Maria	Mina Maria	Galena vein	-0.3
4	A00MZ036	Condorcanqui	Condorcanqui	Chalcopyrite in andesite	-26.7
5	A00MZ042	Huemules	Huemules Sur	Galena vein	-1.8
6	A00MZ060	Arroyo Cascada	Arroyo Cascada	Pyrite in quartz vein	+6.6
7	A00MZ066	Ferrocarrilera	Ferrocarrilera	Pyrite in quartz vein	-0.4

Appendix-12 Measurement results of oxygen isotopic composition.

No.	Sample	District	Locality	Type	T(°C) Max	T(°C) Min	T(°C) Average	NaCl(%) Average	δ 18O (‰) qz	δ 18O (‰) qz-water	δ 18O (‰) water
1	A00MZ012	Andacollo	Mina Sofia, Level1	Vein ore	235	193	214	3.6	11.2	10.8	0.4
2	A00MZ043	Huemules	Huemules Sur	Veinlet	144	109	130	1.8	9.2	17.3	-8.1
3	A00MZ046	Huemules	Huemules Sur	Veinlet	141	105	121	2.2	8.5	18.2	-9.7
4	A00MZ048	Joya del Sol	Brancote-Elena Sur	Qz vein	153	108	131	1.4	7.5	17.2	-9.7
5	A00MZ051	Joya del Sol	Brancote-Galadriel	Qz vein	173	121	147	0.7	4.1	15.6	-11.5
6	A00MZ066	Ferrocarrilera	Ferrocarrilera	Vein ore	223	177	204	2.5	10.3	11.4	-1.1
7	A00TM039	Cushamen	Cushamen	Qz vein	283	215	259	29.6	9.7	8.5	1.2
8	A00TM042	Cerro Gonzalo	Cerro Gonzalo	Qz vein	295	241	274	3.7	10.7	7.9	2.8
9	A00TM059	Estrella Gaucha	Estrella Gaucha	Qz vein	151	119	136	1.2	7.3	16.7	-9.4

Appendix-13 K-Ar radiometric measurement results.

No.	sample name	material	Isotopic Age	Ar^{40}scc/g × 10^{-5}	%Ar^{40}	%K
1	A00NK050	Whole rock	119.0±6.0			
				0.743	84.5	1.58
				0.768	86.2	1.58
2	A00TM009	Plagioclase	53.8±3.0			
				0.145	37.3	0.66
				0.135	36.3	0.66
3	A00TM020	Plagioclase	64.7±3.2			
				0.185	54.2	0.74
				0.194	47.3	0.74

by Teledyne environmental service