

卷末資料 4 鉍石研磨片檢鏡結果

**Apéndice 4 Observaciones de sección pulida**

## Abreviación de minerales

略号	Mineral	Formula	Qz	quartz	SiO <sub>2</sub>
Cry	: cristobalite	SiO <sub>2</sub>	Pl	plagioclase	
Try	: tridymite	SiO <sub>2</sub>	Ser	sericite	
Amor	: Amorphous silica		Chl	chlorite	
Qz	: quartz	SiO <sub>2</sub>	Talc	Talc	
Will	: Willhendersonite	KCa(Al <sub>3</sub> Si <sub>3</sub> O <sub>20</sub> )·5H <sub>2</sub> O	Jar	Jarosite	KFe <sub>3</sub> [(OH) <sub>6</sub> (SO <sub>4</sub> ) <sub>2</sub> ]
Smc	: smectite		Cal	calcite	CaCO <sub>2</sub>
Kol	: kaolinite	Al <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> ·(OH) <sub>4</sub>	Py	pyrite	FeS <sub>2</sub>
Hally	: Halloysite		Asp	Arsenopyrite	FeAsS
Ser	: sericite		Rt	rutile	TiO <sub>2</sub>
Phyr	: pyrophyllite	Al <sub>2</sub> Si <sub>4</sub> O <sub>10</sub> ·(OH) <sub>2</sub>	Hm	Hematite	Fe <sub>2</sub> O <sub>3</sub>
Chl	: chlorite		Goe	Goethite	FeO(OH)
S/S	: sericite/smectite				
Pl	: plagioclase				
K-fl	: potash feldspar				
Bio	: biotite				
Ep	: epidote	Ca <sub>2</sub> (Al,Fe <sup>3+</sup> ) <sub>3</sub> [OH O Si <sub>4</sub>  Si <sub>2</sub> O <sub>7</sub> ]			
Al	: alunite	KAl <sub>3</sub> [(OH) <sub>6</sub> (SO <sub>4</sub> ) <sub>2</sub> ]			
Na-al	: natroalunite	NaAl <sub>3</sub> [(OH) <sub>6</sub> (SO <sub>4</sub> ) <sub>2</sub> ]			
Jar	: Jarosite	KFe <sub>3</sub> [(OH) <sub>6</sub> (SO <sub>4</sub> ) <sub>2</sub> ]			
Pg	: Plumbogummite	PbAl <sub>3</sub> H[(OH) <sub>6</sub> (SO <sub>4</sub> ) <sub>2</sub> ]			
Bar	: barite	BaSO <sub>4</sub>			
Gy	: Gypsum	CaSO <sub>4</sub> ·2H <sub>2</sub> O			
Cal	: calcite	CaCO <sub>2</sub>			
Py	: pyrite	FeS <sub>2</sub>			
Mag	: magnetite	Fe <sub>3</sub> O <sub>4</sub>			
Rt	: rutile	TiO <sub>2</sub>			
At	: Anatase	TiO <sub>2</sub>			
24.0	: 2θ = 24.0				
40.3	: 2θ = 40.3				

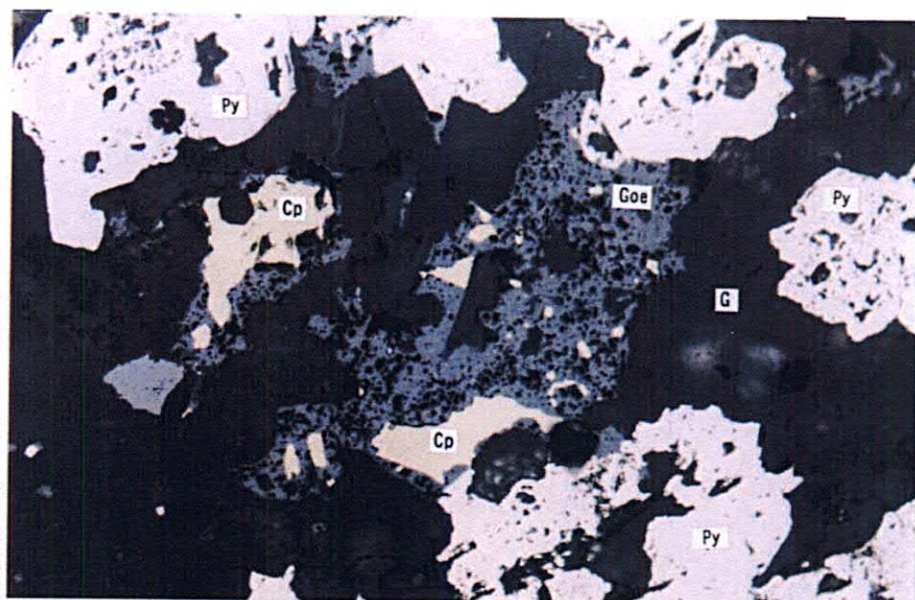
# 鉍石研磨片顯微鏡觀察結果

Resultado de observaciones microscopicas de seccion pulida

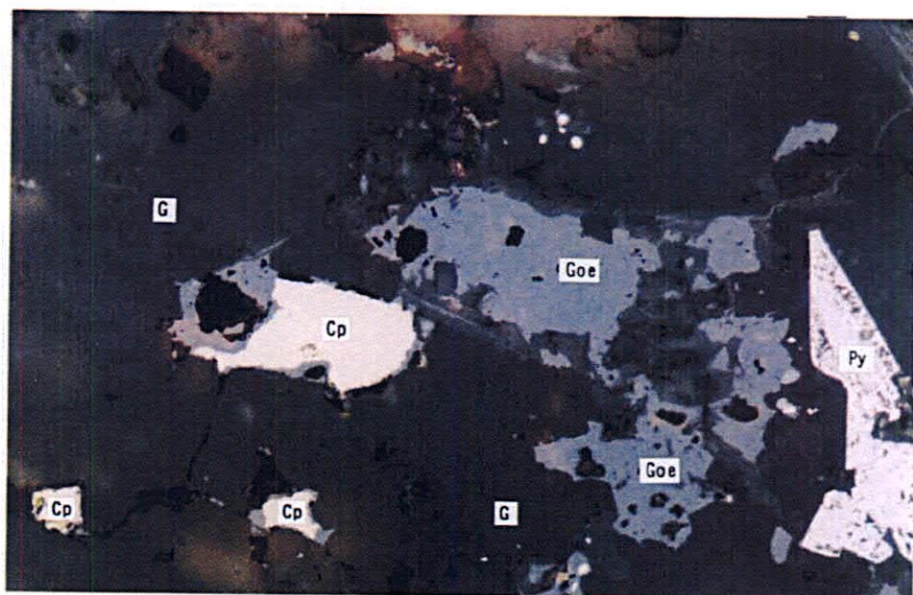
		Minerales)		Codigo																														
				Au	:Gold	Cp	: Chalcopyrite	Cc	: Chalcocite	Cv	: Covellite	Tn	: Tennantite	Gn	: Galena	Sp	: Sphalerite	Py	: Pyrite	Ms	: Marcasite	Po	: Pyrrhotite	AsP	: Arsenopyrite	Mala	: Malachite	Hm	: Hematite	Goe	: Goethite	Grap	: Graphite	C
Pelechuco	1	11081 MH		■											◎	△																○		
	2	11101 MH		■			■				■				△	△	■	■													■			
Hilo Hilo	3	11120 MH		■							■	■		○	△	○	■																	
	4	11134 MH		■							■	■				○	△														■			
	5	11143 MH									■	■						◎																
	6	11147 MH	■	■							■			■			△	△																
	7	11508 LA									△	△	△																					
	8	11511 LA									■				○	△	■															△		
	9	11515 LA			△								■			◎																		
Aucapata	10	10833 ATH			△										○											△		○						
	11	10840 AYZ			△			■							◎			■										○						
	12	11038 MH			■										◎																			
	13	11047 MH			△			■							○							△												
	14	11055 MH			△			■							◎	△																		
	15	11066 MH			■				■						△																			
	16	11165 MH													◎															■				
17	11171 MH			△											◎																			
Tacacoma	18	11010 MH													○						■								■					
	19	11232 OF			■										○						■								■					
	20	11419 LA		◎	△							■			■									■									△	

Cantidad   ◎ :mucho   ○ :regular   △ :poco   ■ :trazas

顕微鏡写真(反射光)



鉍染状の黄銅鉍と黄鉄鉍  
および次生鉍物の針鉄鉍。

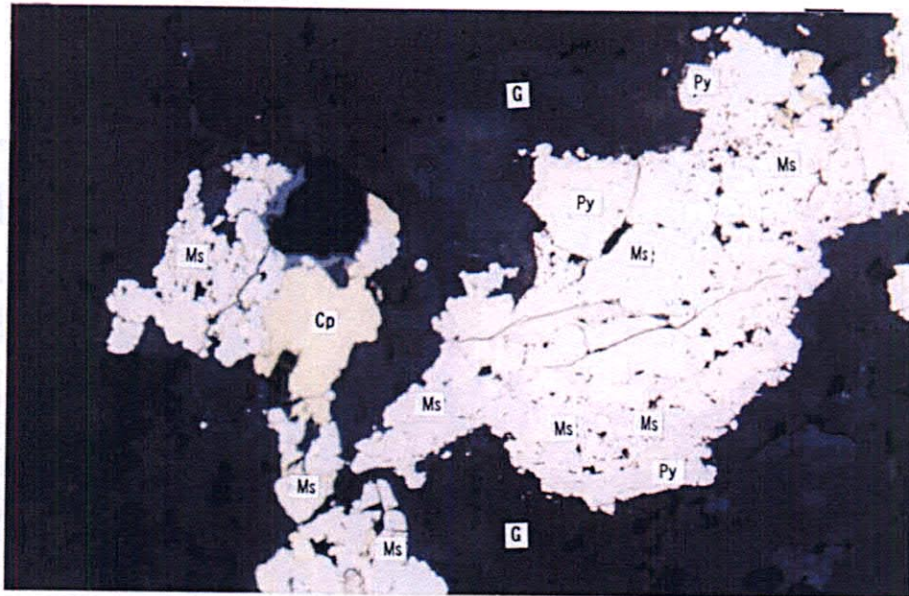


鉍染状の黄銅鉍と黄鉄  
鉍および次生鉍物の針  
鉄鉍。



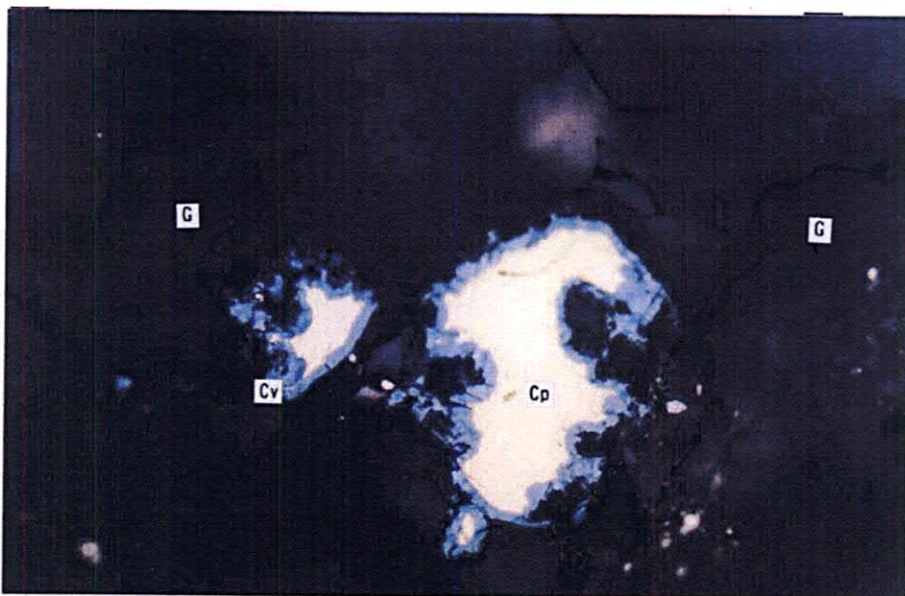


顕微鏡写真(反射光)



鉍染状の黄銅鉍と黄鉄鉍  
および白鉄鉍。

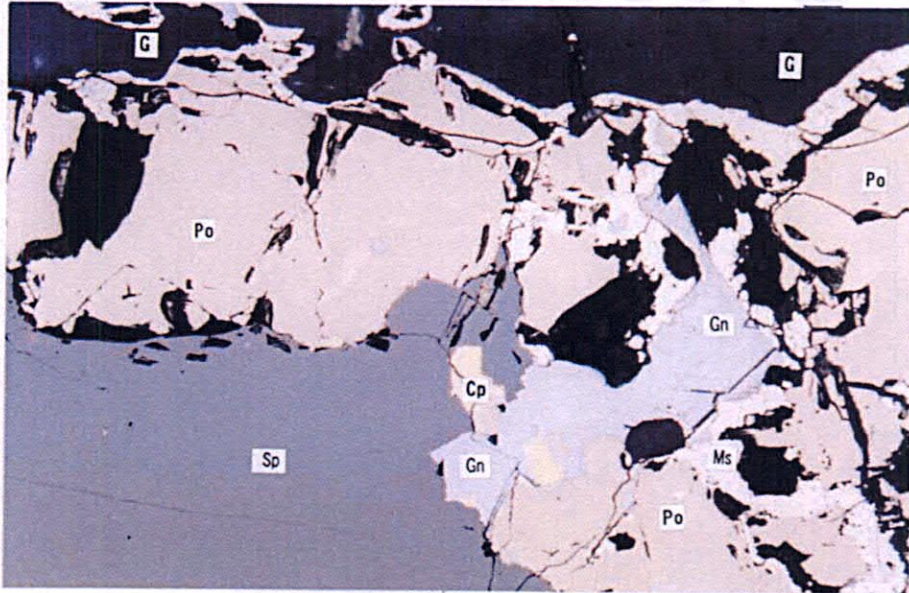
0 0.1mm



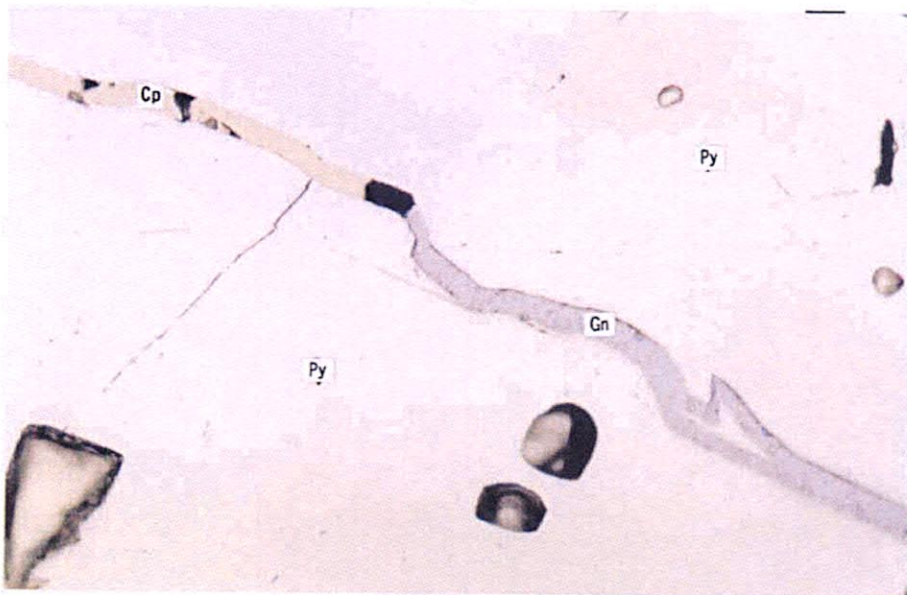
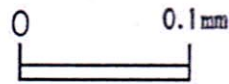
鉍染状の黄銅鉍と黄銅鉍  
を交代するコペリン。

0 0.04mm

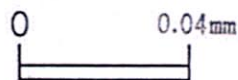
顕微鏡写真(反射光)



磁硫鉄鉱と共存する閃亜鉛鉱と方鉛鉱および黄銅鉱。白鉄鉱は磁硫鉄鉱を交代。

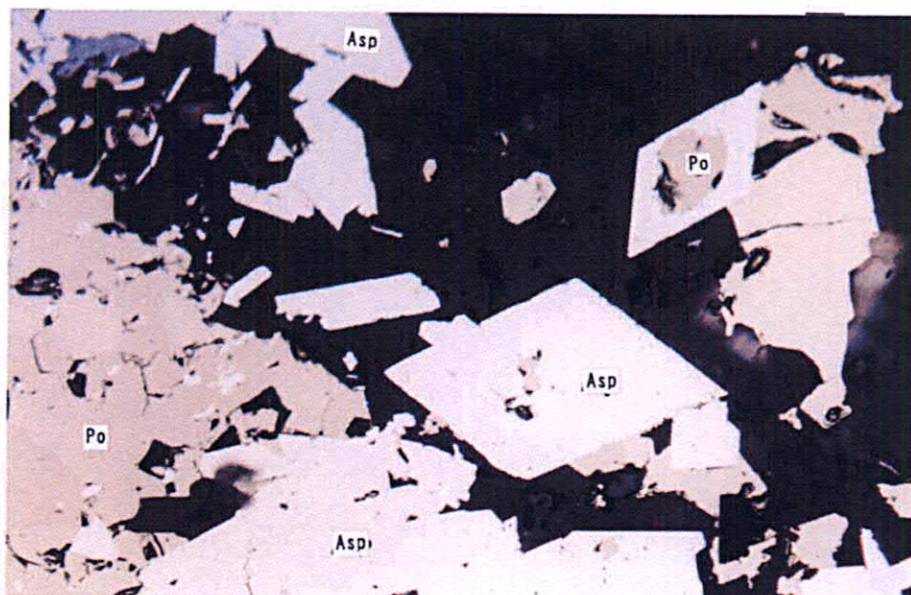


黄鉄鉱中脈状の方鉛鉱と黄銅鉱。

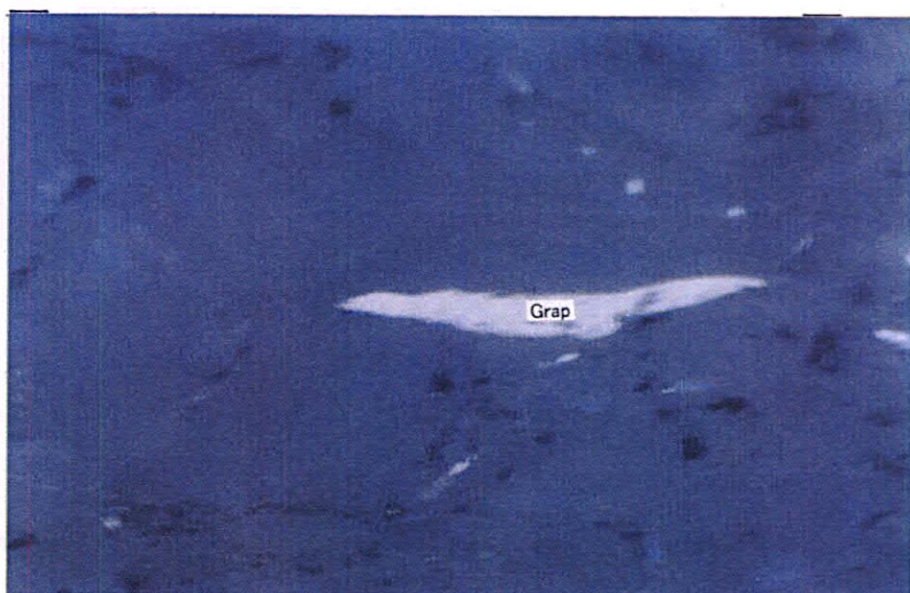




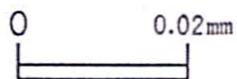
顕微鏡写真(反射光)



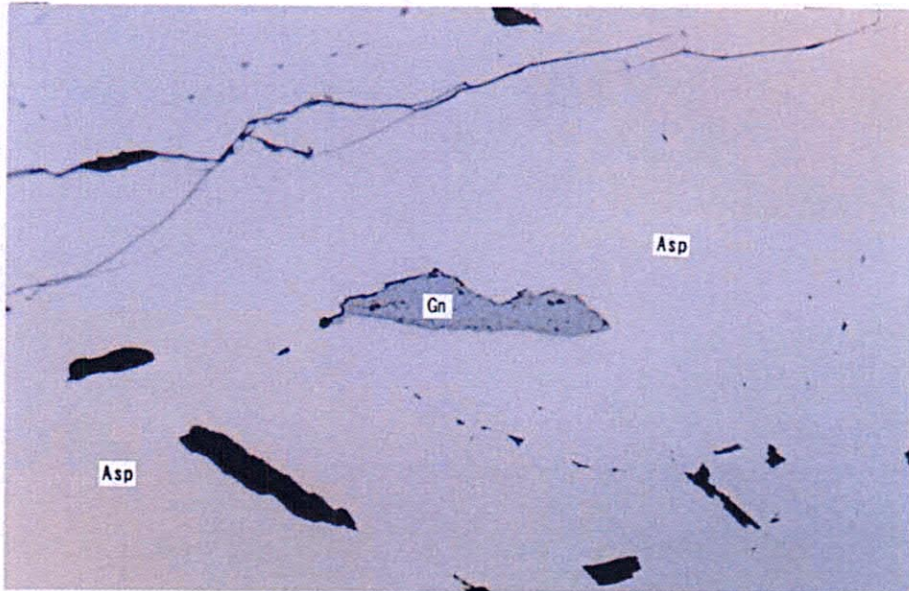
鉍染状の硫砒鉄鉍と磁硫鉄鉍。



葉片状の炭質物。

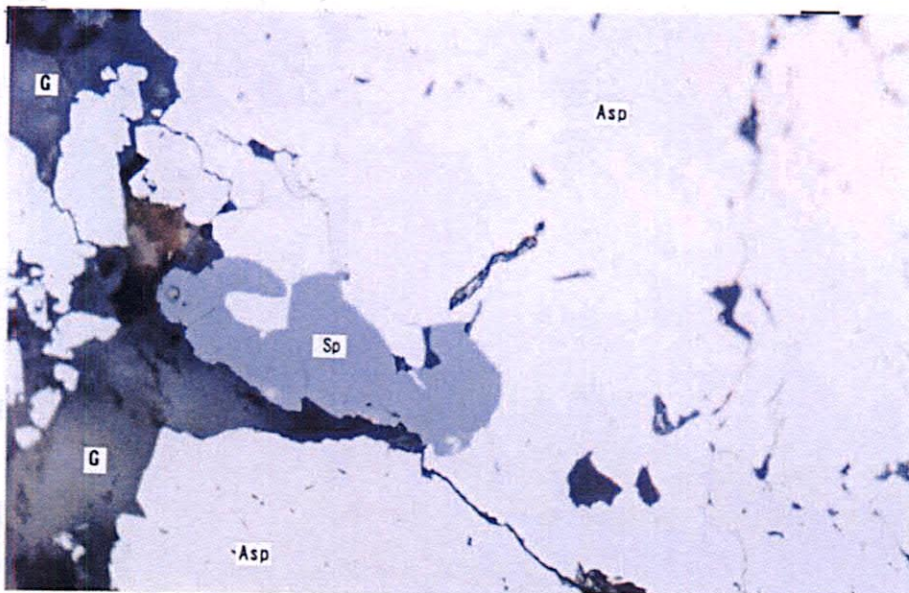


顕微鏡写真(反射光)



硫砒鉄鉱中の方鉛鉱。

0 0.04mm



硫砒鉄鉱と共存する閃亜鉛鉱。

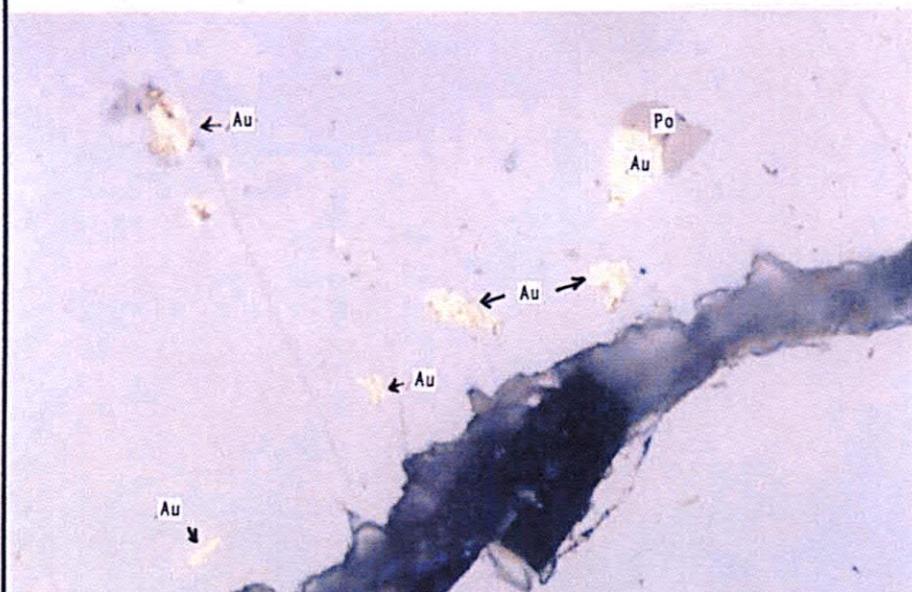
0 0.04mm





鉍染状の硫砒鉄鉍。

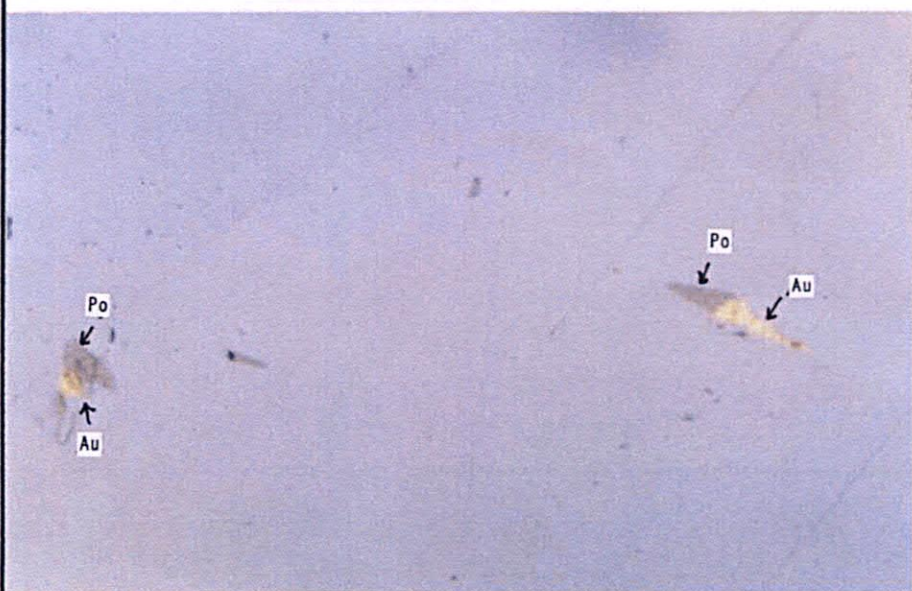
0 0.2mm



同上枠内拡大

硫砒鉄鉍中の自然金  
(0.003mm~0.01mm)

0 0.02mm



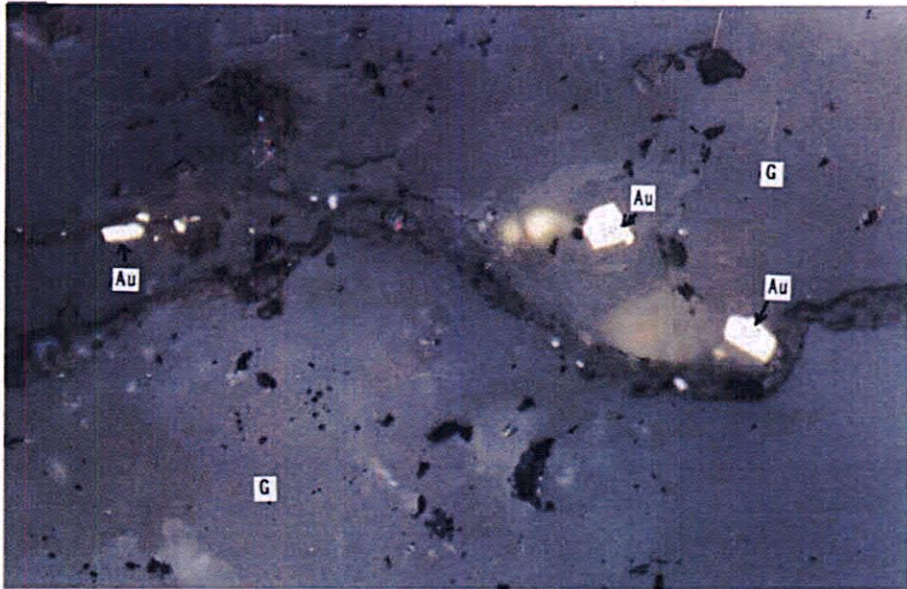
硫砒鉄鉍中の自然金  
(0.003mm~0.01mm)

0 0.02mm

Film No. -27.26.28

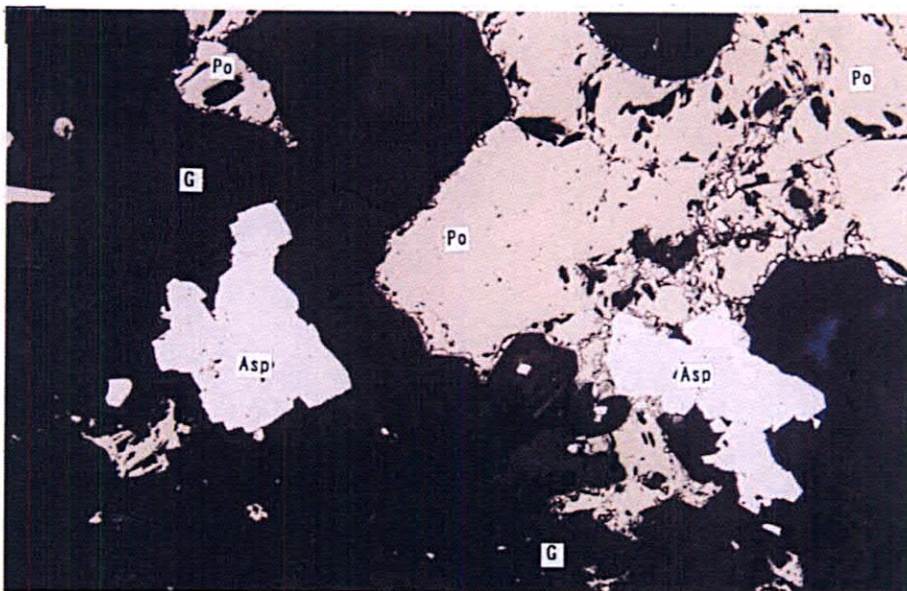


顕微鏡写真(反射光)



鉍染状の自然金  
(0.002mm~0.007mm)

0 0.02mm

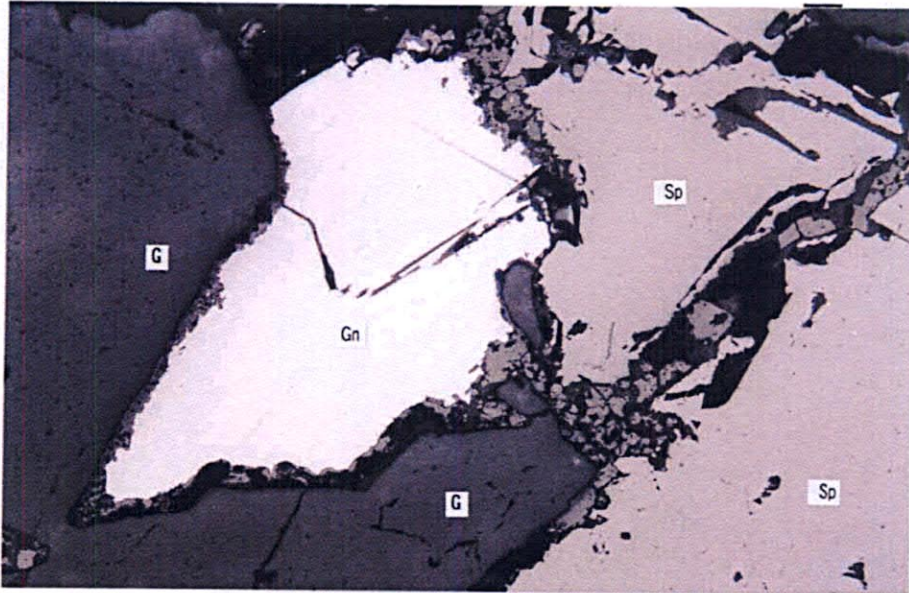


鉍染状の硫砒鉄鉍と磁硫鉄鉍。

0 0.2mm



顕微鏡写真(反射光)



鉍染状の方鉛鉍と閃亜鉛鉍。

0 0.2mm



鉍染状の方鉛鉍と黄鉄鉍  
および黄鉄鉍中の方鉛鉍。

0 0.2mm

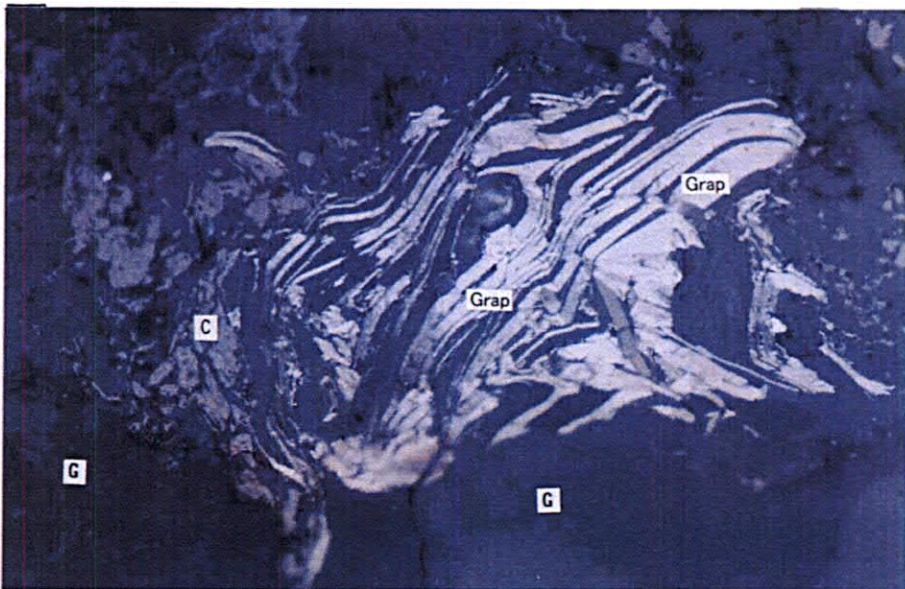


顕微鏡写真(反射光)



鉍染状の方鉛鉍。

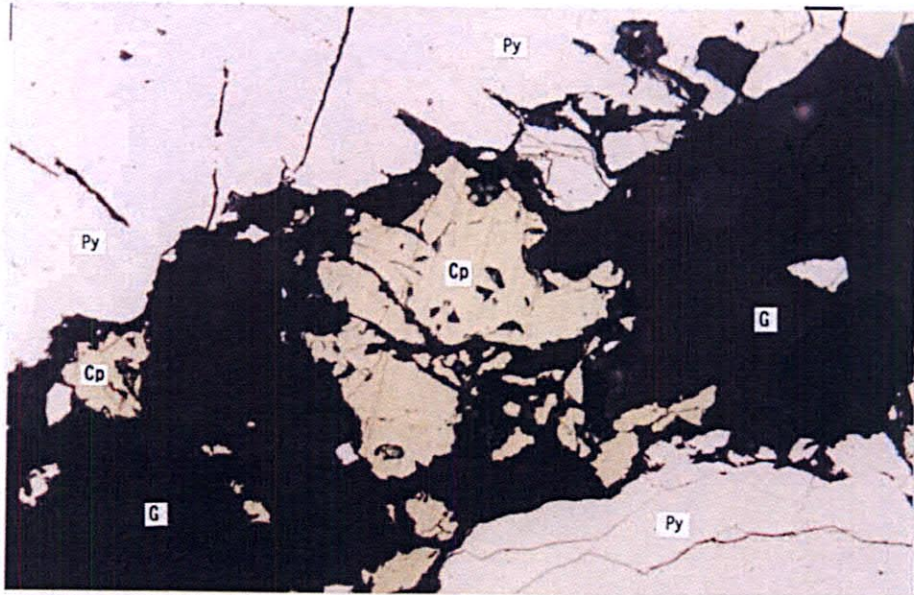
0 0.04mm



葉片状の炭質物。

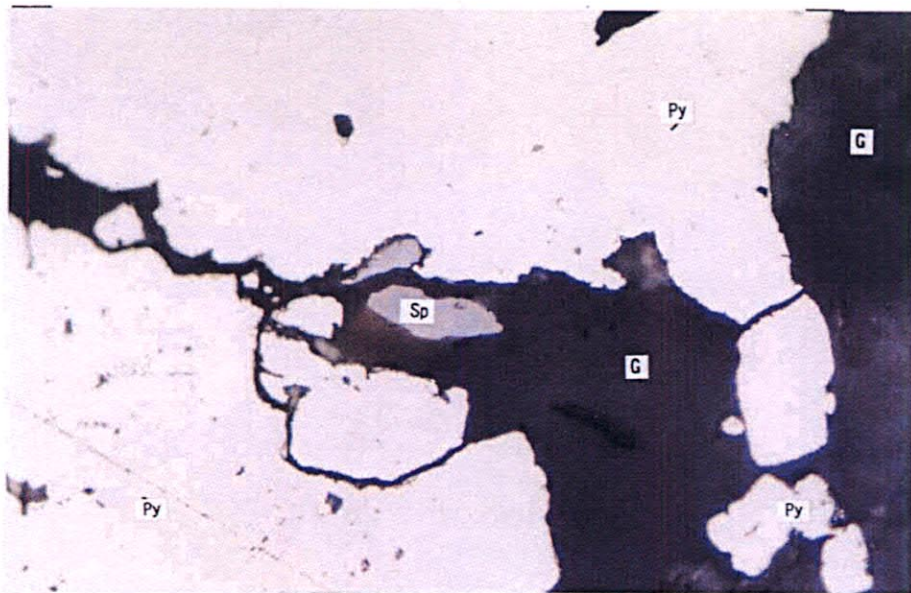
0 0.04mm

顕微鏡写真(反射光)



鉍染状の黄銅鉍と黄鉄鉍。

0 0.1mm

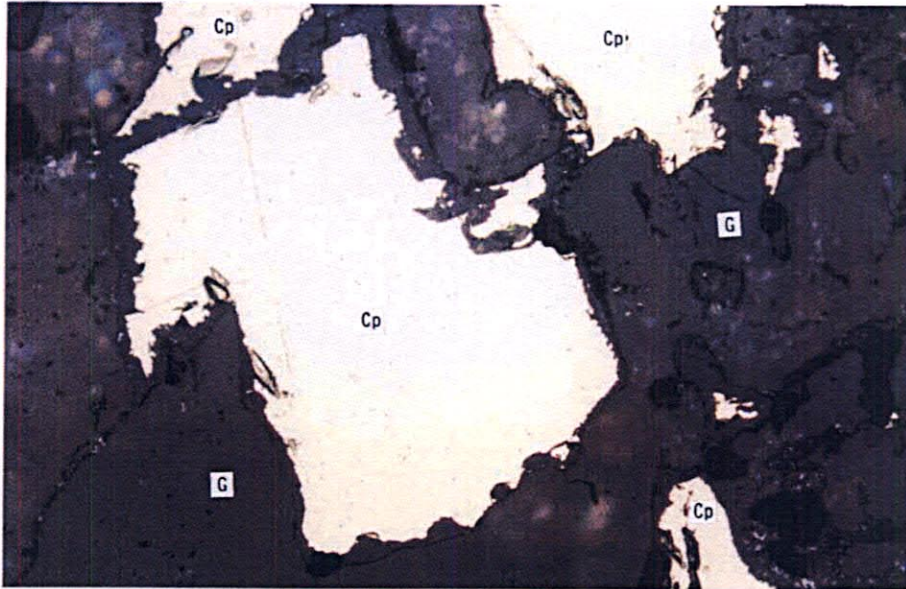


鉍染状の閃亜鉛鉍と黄鉄鉍。

0 0.04mm

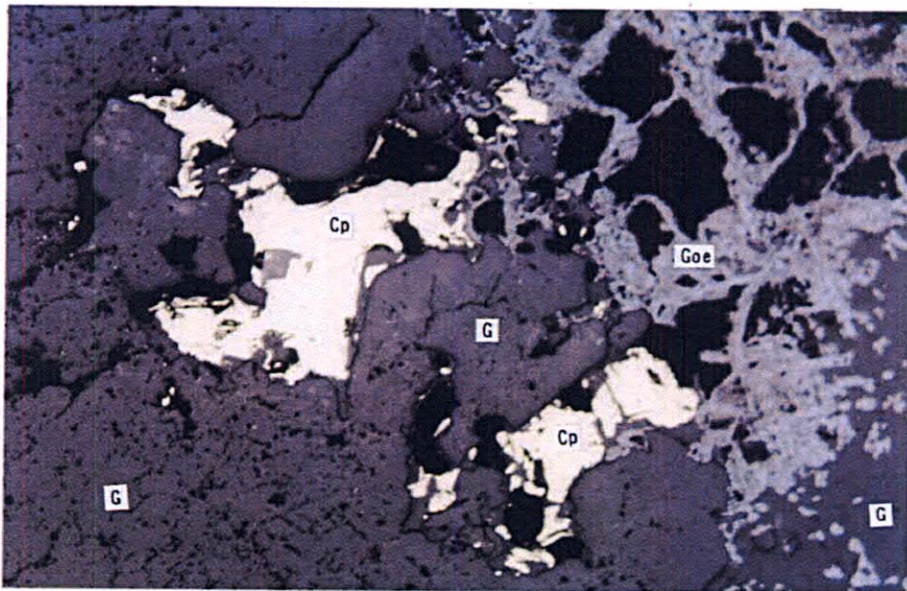


顕微鏡写真(反射光)



鉍染状の黄銅鉍。

0 0.1mm

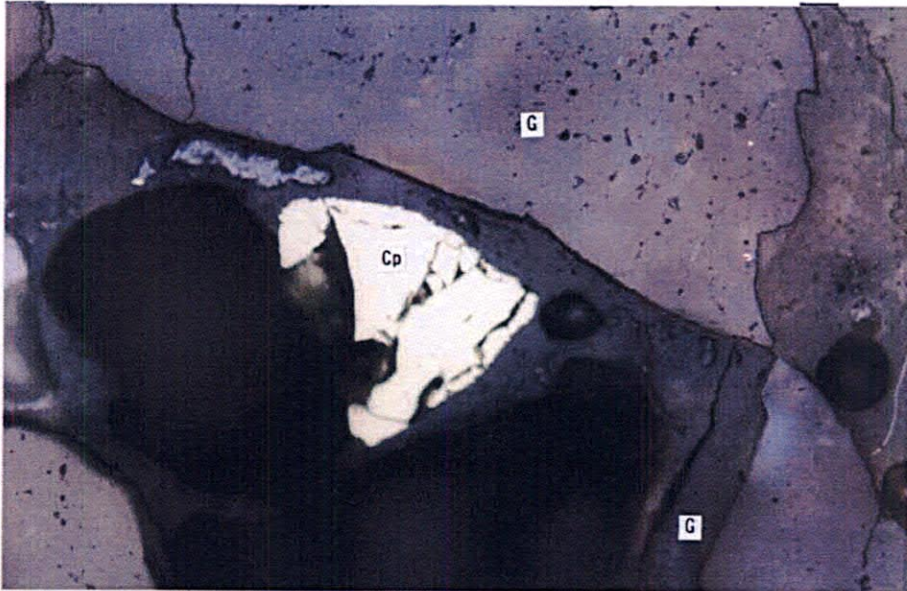


鉍染状の黄銅鉍と次生鉍物の針鉄鉍。

0 0.2mm

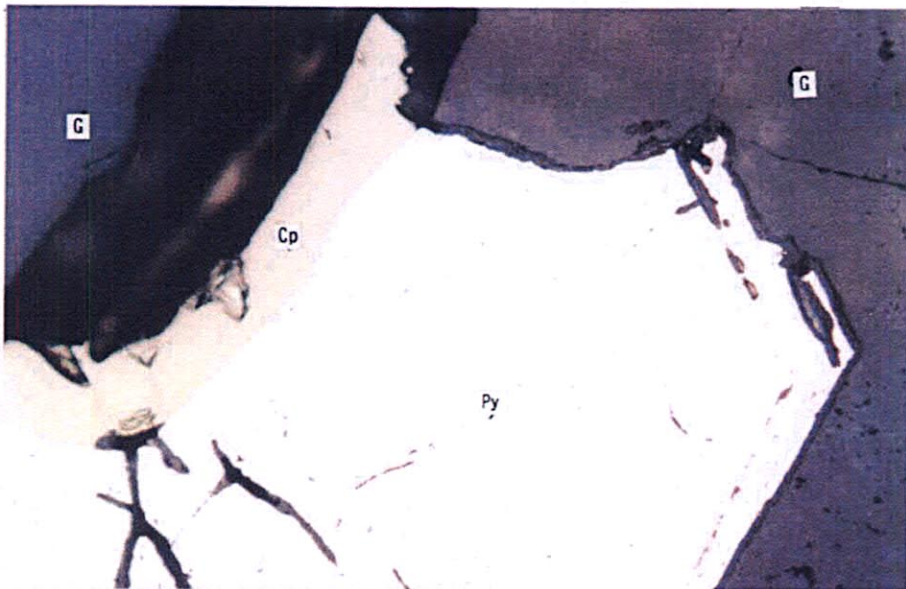


顕微鏡写真(反射光)



鉍染状の黄銅鉍。

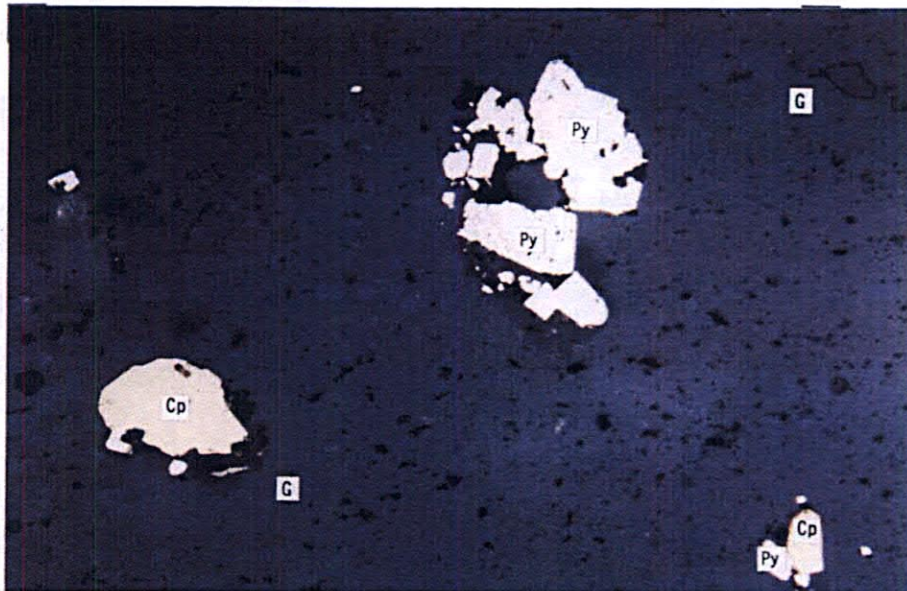
0 0.1mm



鉍染状の黄鉄鉍と共存する黄銅鉍。

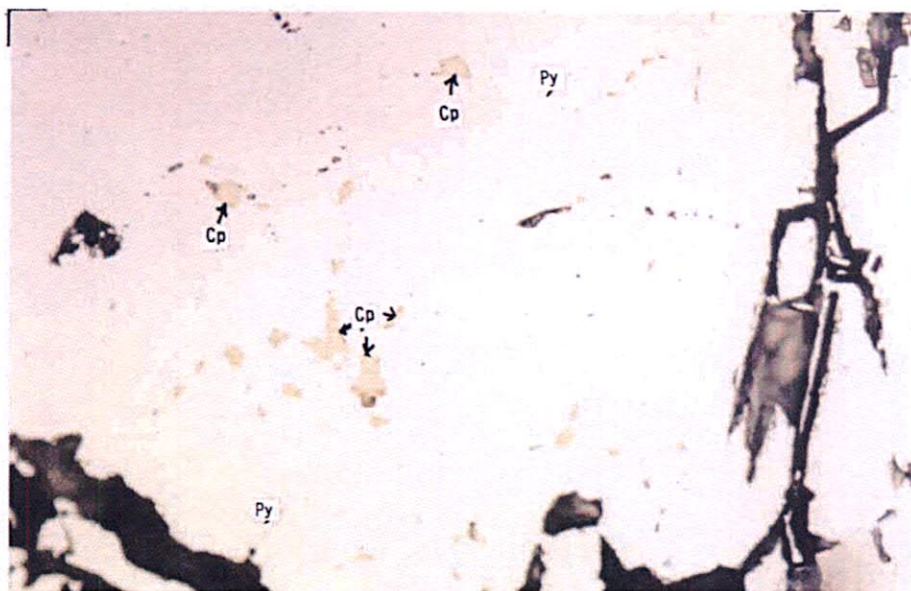
0 0.1mm

顕微鏡写真(反射光)



鉍染状の黄銅鉍と黄鉄鉍。

0 0.1mm

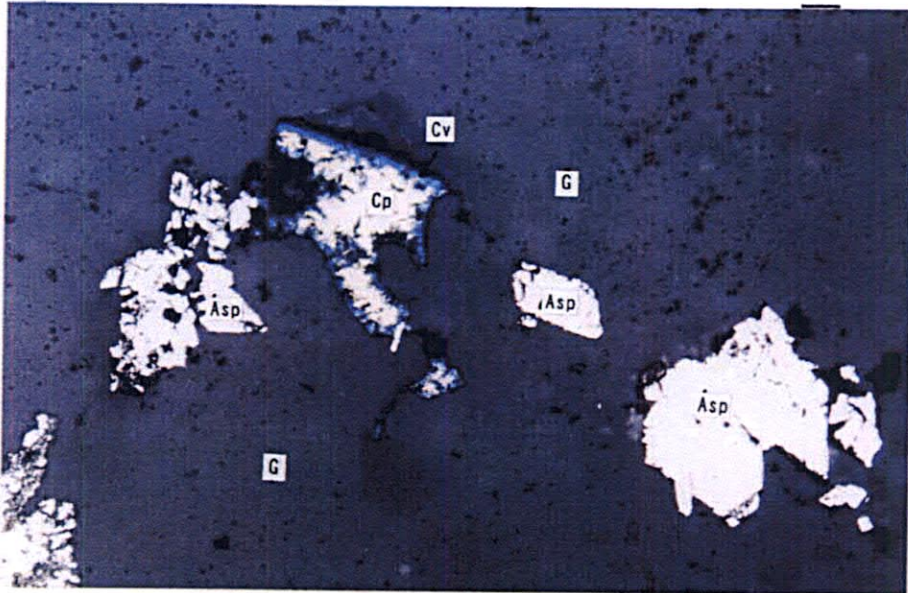


黄鉄鉍中点滴状の黄銅鉍。

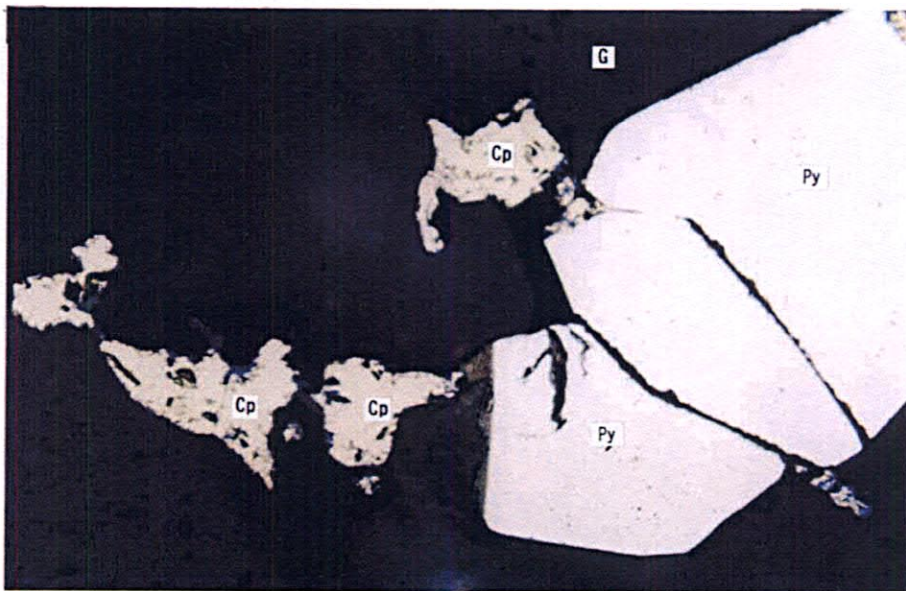
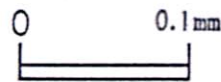
0 0.04mm



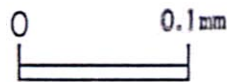
顕微鏡写真(反射光)



鉍染状の黄銅鉍と硫砒鉄鉍および黄銅鉍を交代するケリ。

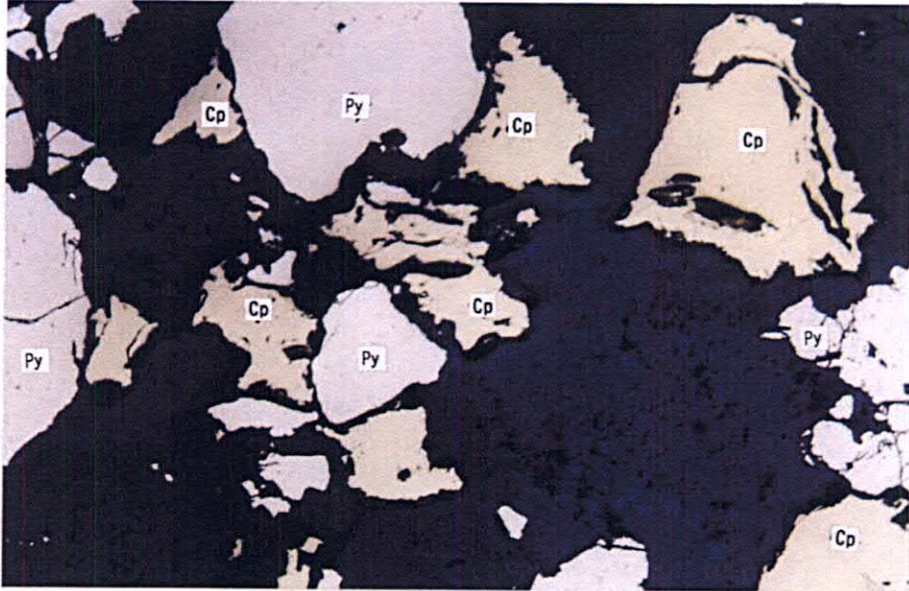


鉍染状の黄銅鉍と黄鉄鉍。



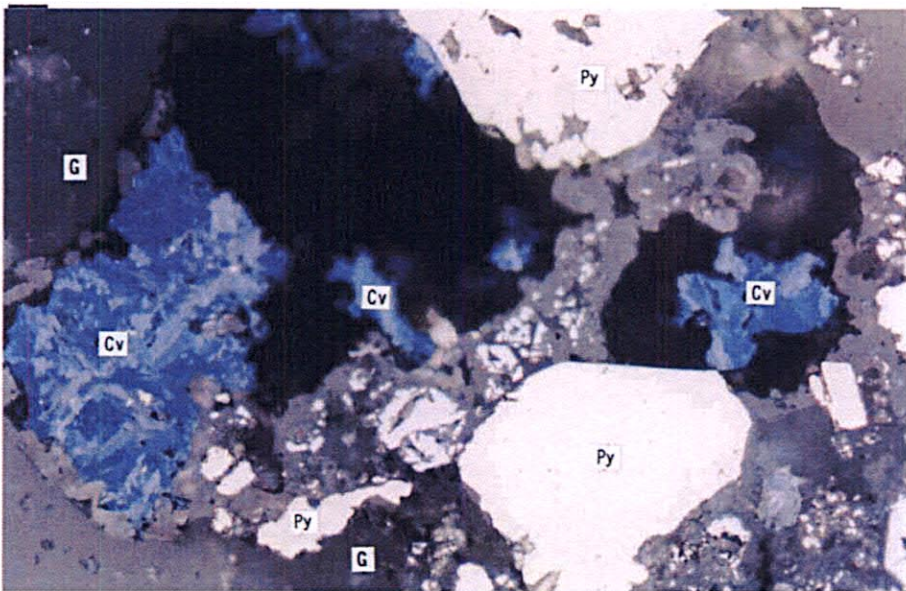


顕微鏡写真(反射光)



鉍染状の黄銅鉍と黄鉄鉍。

0 0.2mm

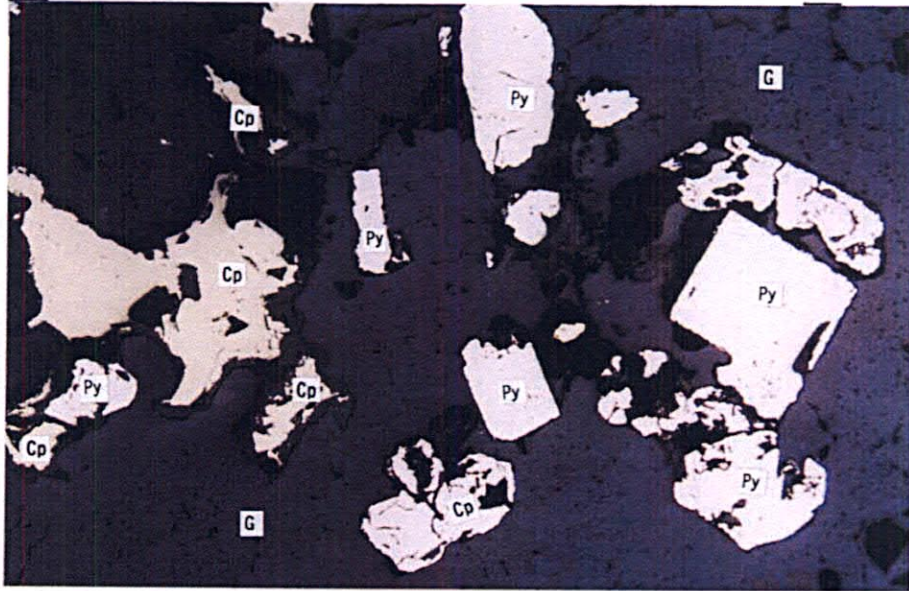


鉍染状の黄鉄鉍と次生鉍物のコペリン。

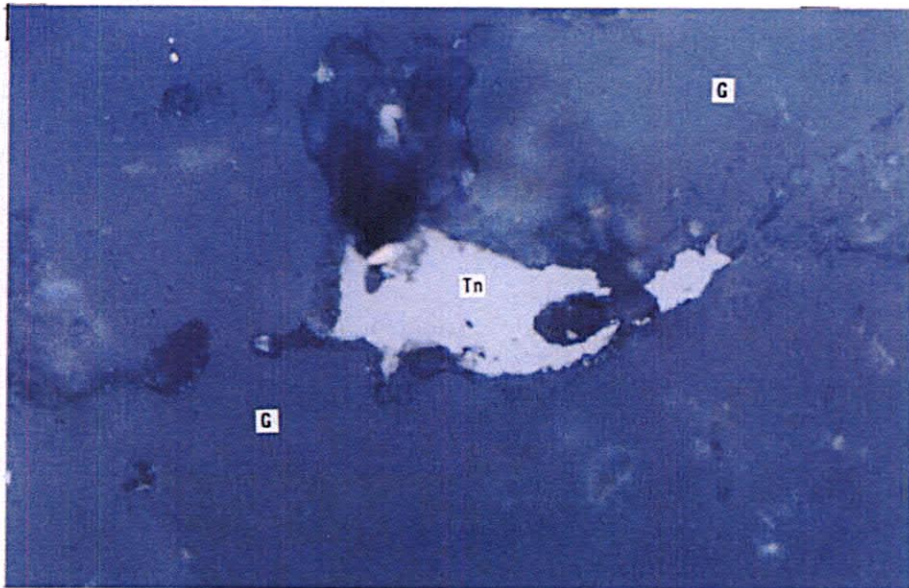
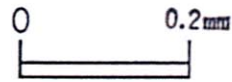
0 0.04mm



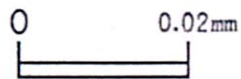
顕微鏡写真(反射光)



鉍染状の黄銅鉍と黄鉄鉍。

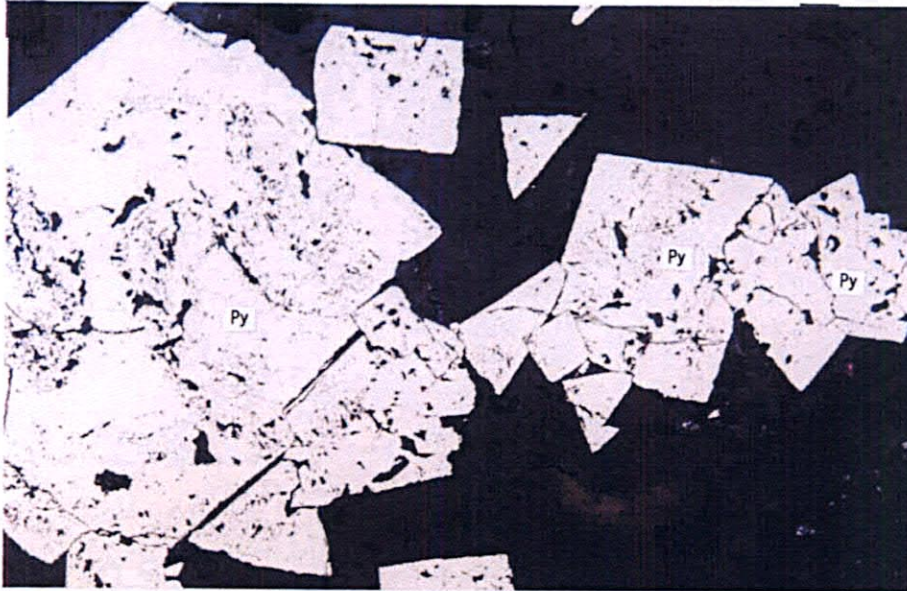


鉍染状のテナンタイト?



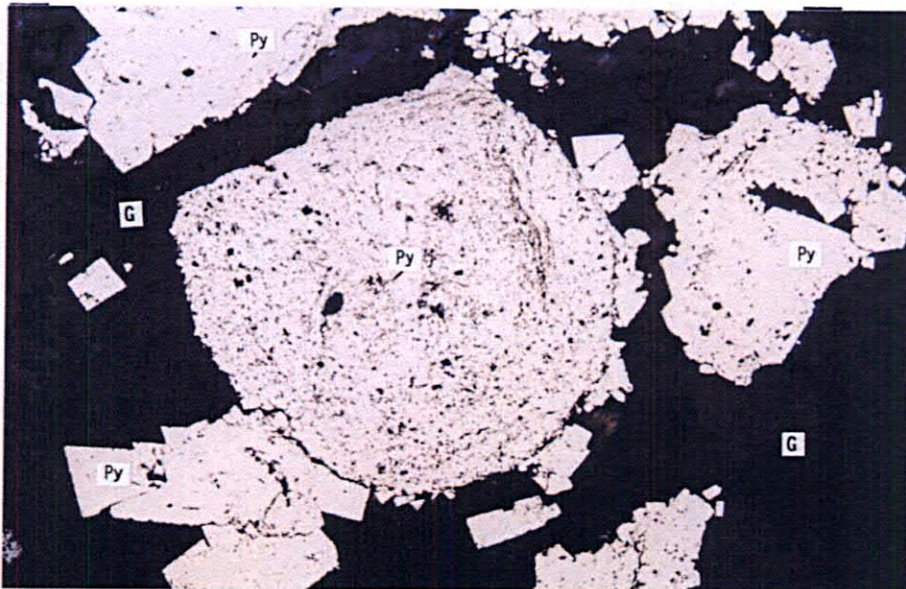


顕微鏡写真(反射光)



鉍染状の黄鉄鉍。

0 0.2mm

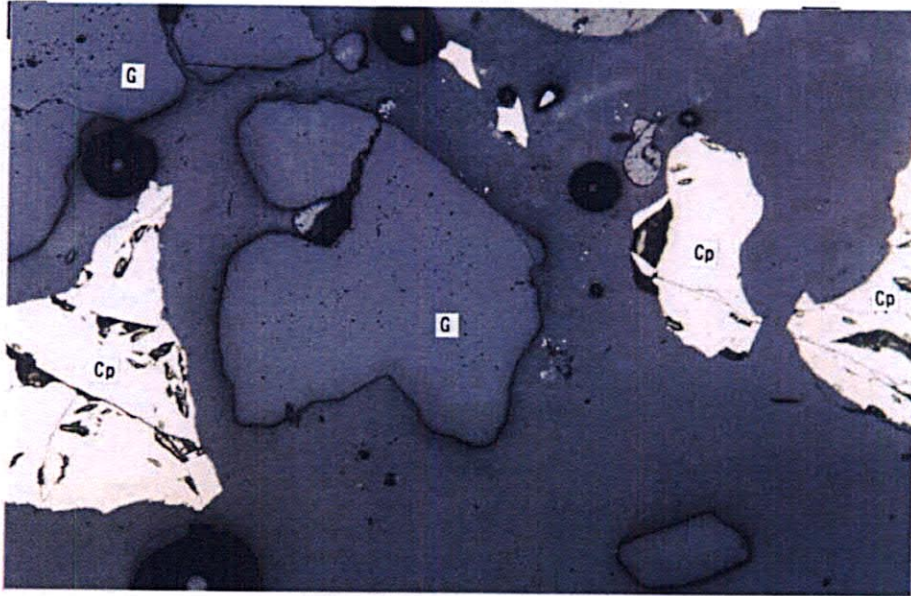


鉍染状の黄鉄鉍。

0 0.2mm

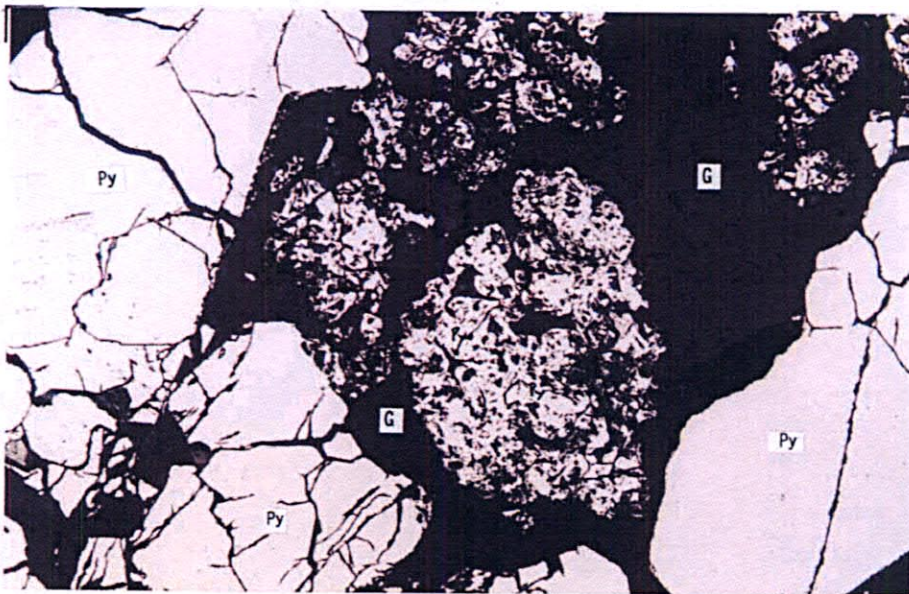


顕微鏡写真(反射光)



鉍染状の黄銅鉍。

0 0.2mm

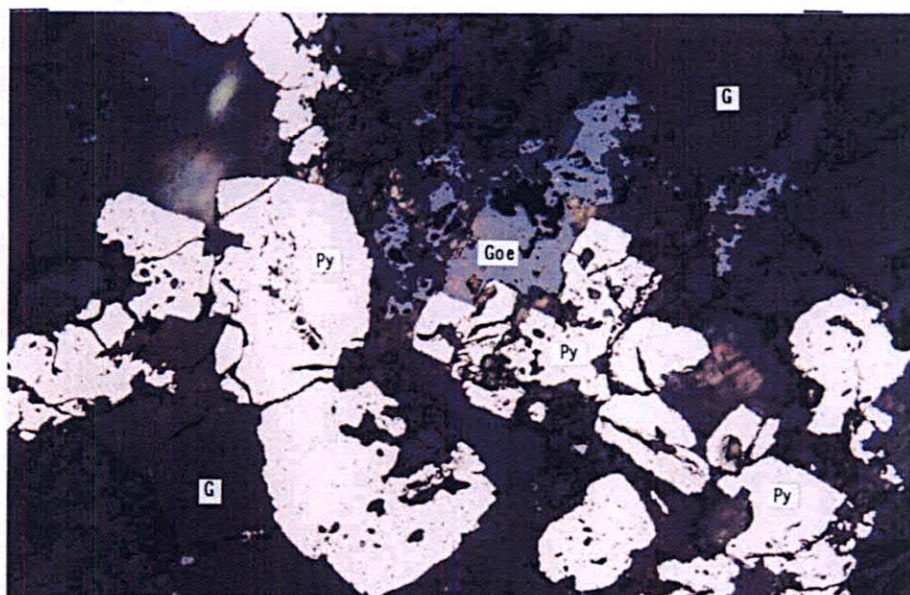


鉍染状の自形と他形を示す黄鉄鉍。

0 0.2mm

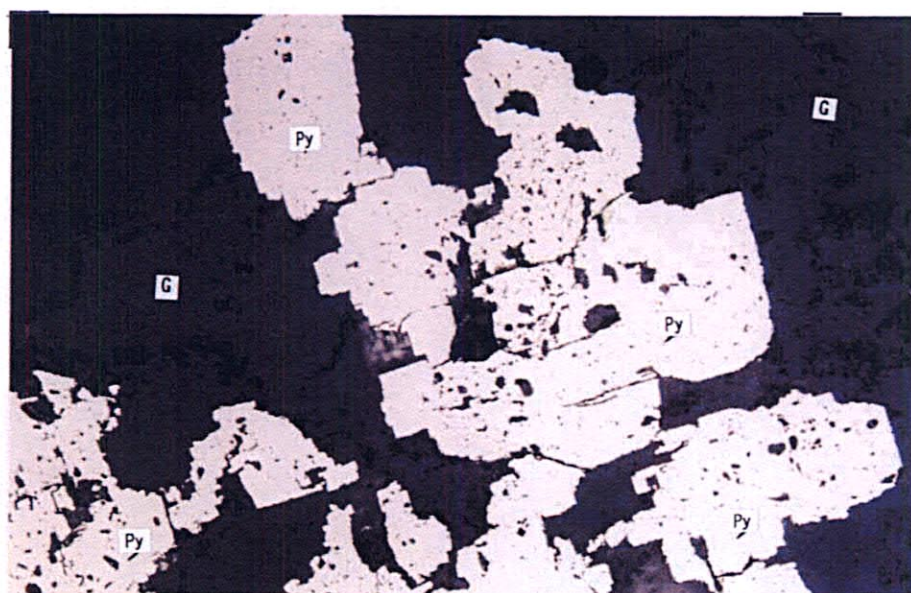


顕微鏡写真(反射光)



鉍染状の黄鉄鉍と次生鉍物の針鉄鉍。

0 0.2mm

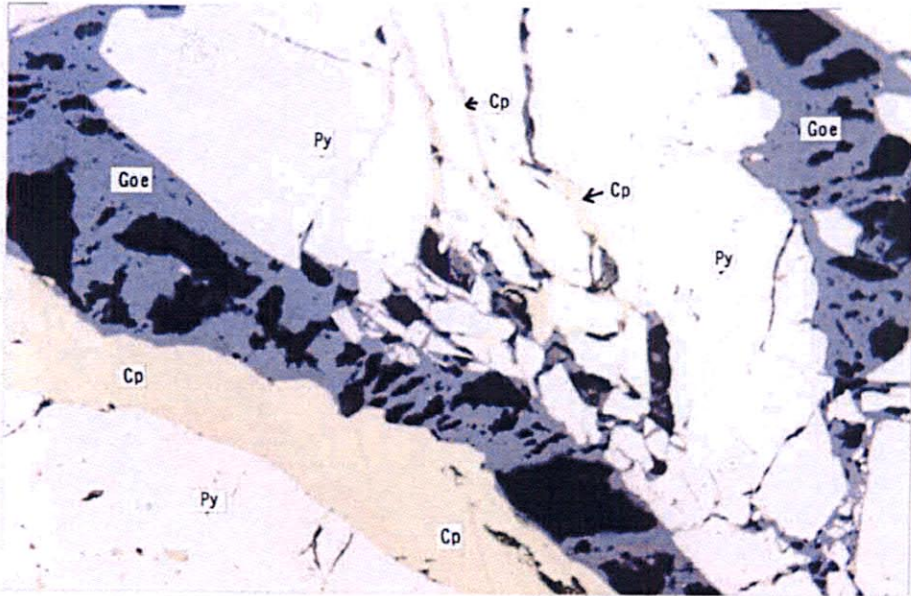


鉍染状の黄鉄鉍。

0 0.2mm

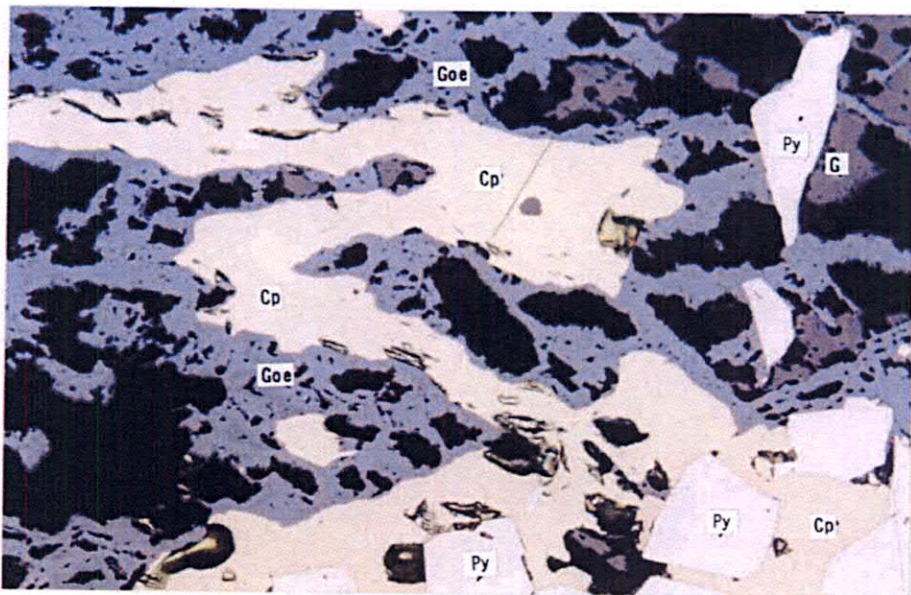


顕微鏡写真(反射光)



鉍染状の黄鉄鉍と黄銅鉍、  
および次生鉍物の針鉄鉍。

0 0.1mm

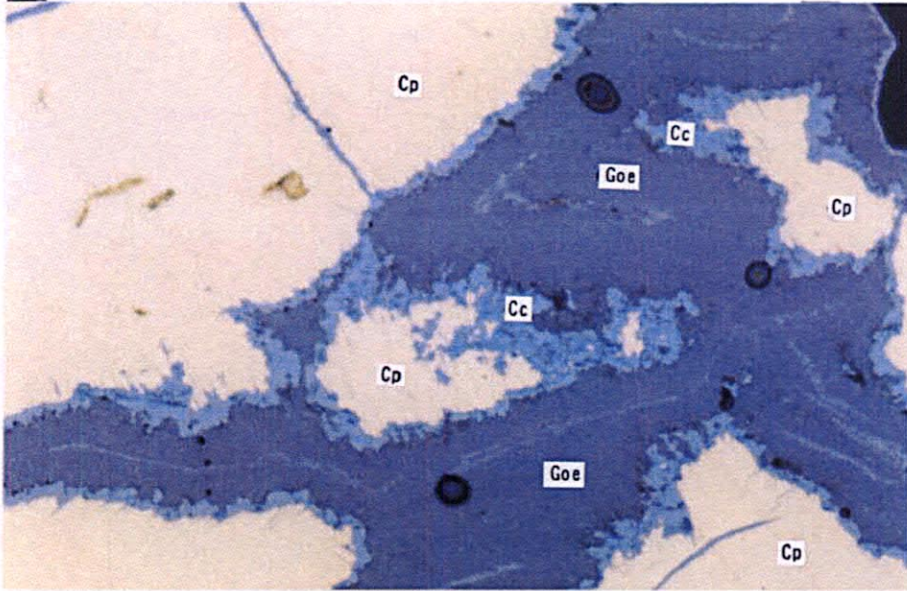


鉍染状の黄銅鉍と黄鉄鉍  
および次生鉍物の針鉄鉍。

0 0.1mm

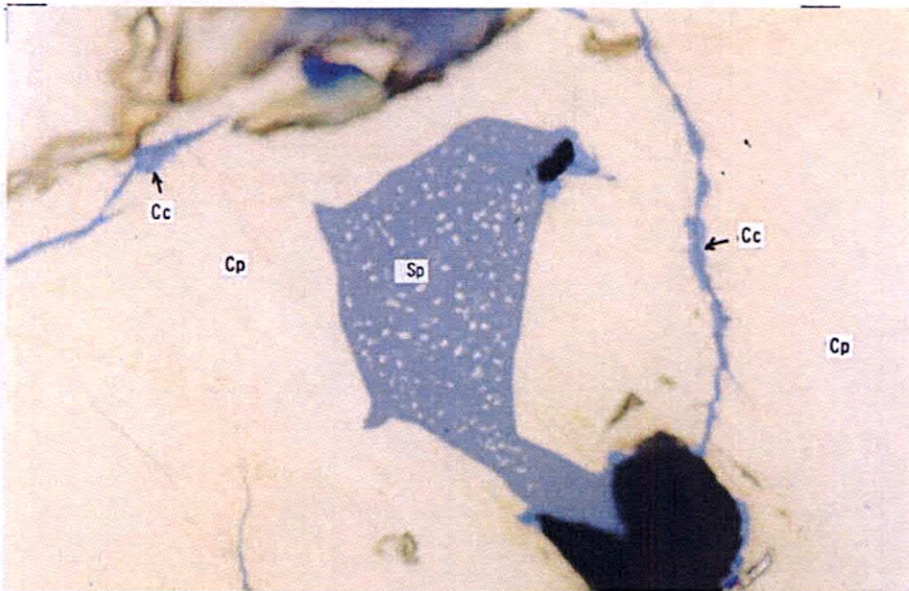


顕微鏡写真(反射光)



黄銅鉱の周辺部を交代する輝銅鉱と次生鉱物の針鉄鉱。

0 0.04mm



黄銅鉱中の閃亜鉛鉱と黄銅鉱の一部を交代する輝銅鉱。

0 0.04mm

卷末資料 5 X 線回折結果  
**Apéndice 5 Difracción de rayos X**



# X線回折解析結果一覽表

## Resultado de analisis de difraccion de rayos X

Codigo		Minerales	Quartz	plagioclase	albite	sericite	chlorite	sericite (2M)	kaolinite	halloysite	barite	calcite	siderite	magnesite	pyrite	hematite	fluorapatite	lutil	goethite	marcasite
1	11068 MH	Pelechuco	⊙		⊙	⊙	⊙											△		
2	11446 LA	Pelechuco	⊙		⊙	⊙	⊙											△		
3	11447 LA	Pelechuco	△		⊙		⊙													
4	10364 HV	Pelechuco	⊙		○	⊙	⊙											△		
5	10365 HV	Pelechuco	⊙		⊙	⊙	⊙											○		
6	11338 RT	Pelechuco	⊙		⊙	⊙	⊙											△		
7	11448 LA	Pelechuco	○		⊙	⊙	⊙											○		
8	11070 MH	Pelechuco	⊙		○	⊙	⊙											○		
9	10366 HV	Pelechuco	⊙			⊙	⊙											○		
10	10368 HV	Pelechuco	⊙		○	⊙	⊙											△		
11	11071 MH	Pelechuco	⊙		⊙	⊙	⊙											△		
12	11072 MH	Pelechuco	⊙		⊙	⊙	⊙											○		
13	11073 MH	Pelechuco	⊙		⊙	⊙	⊙											○		
14	11074 MH	Pelechuco	△				⊙						.						△	.
15	10369 HV	Pelechuco	⊙		○	⊙	⊙											.		.
16	10370 HV	Pelechuco	⊙		○	⊙	⊙											△		
17	10371 HV	Pelechuco	⊙		⊙	⊙	⊙											△		
18	11343 R	Pelechuco	⊙		⊙	⊙	⊙													
19	11344 R	Pelechuco	⊙		⊙	⊙	⊙											△		
20	11345 R	Pelechuco	⊙		⊙	⊙	⊙							.						
21	11347 R	Pelechuco	⊙		⊙	⊙	⊙							.						
22	11449 LA	Pelechuco	⊙		⊙	⊙	⊙			.										
23	11450 LA	Pelechuco	⊙		⊙	⊙	⊙											△		
24	11451 LA	Pelechuco	⊙		⊙	⊙	⊙											△		
25	11452 LA	Pelechuco	⊙		⊙	⊙	⊙											△		
26	11349 R	Pelechuco	⊙		⊙	⊙	⊙			.								△		
27	11350 R	Pelechuco	⊙		⊙	⊙	⊙							.						
28	10373 HV	Pelechuco	⊙		⊙	△	⊙													
29	10374 HV	Pelechuco	⊙		○	⊙	⊙											.		
30	10375 HV	Pelechuco	⊙		⊙	⊙	⊙											△		
31	10377 HV	Pelechuco	⊙		⊙	⊙	⊙											△		
32	11453 LA	Pelechuco	⊙		⊙	⊙	⊙													
33	11455 LA	Pelechuco	⊙		⊙	⊙	⊙											△		
34	11456 LA	Pelechuco	⊙		⊙	⊙	⊙									.				
35	11801 ATH	Pelechuco	⊙		⊙	⊙	⊙							.						
36	11802 ATH	Pelechuco	⊙				⊙													
37	11803 ATH	Pelechuco	⊙		○	⊙	⊙							.				.		
38	11804 ATH	Pelechuco	⊙		⊙	.	⊙													
39	11075 MH	Pelechuco	⊙		○	⊙	⊙											△		
40	11076 MH	Pelechuco	⊙		⊙	⊙	⊙											△		
41	11077 MH	Pelechuco	⊙			⊙	⊙											△		
42	11351 RI	Pelechuco	⊙		⊙	⊙	⊙											○		
43	11353 RI	Pelechuco	⊙		⊙	⊙	⊙											△		
44	11354 RI	Pelechuco	⊙		⊙	⊙	⊙											△		
45	11355 RI	Pelechuco	⊙		⊙	⊙	⊙											△		
46	11457 LA	Pelechuco	⊙		⊙	⊙	⊙											.		
47	10378 HV	Pelechuco	⊙		⊙	.	⊙													
48	10379 HV	Pelechuco	⊙		⊙	⊙	⊙											.		
49	10380 HV	Pelechuco	⊙		⊙	⊙	⊙											△		
50	11078 MH	Pelechuco	△		⊙		⊙													
51	11079 MH	Pelechuco	⊙		⊙	⊙	⊙					△			.					
52	11081 MH	Pelechuco	△				⊙						.					.		△
53	11082 MH	Pelechuco	⊙	△		⊙	○					△						○		
54	11083 MH	Pelechuco	⊙		⊙	⊙	⊙											△		
55	11356 R	Pelechuco	⊙		○	⊙	⊙											○		

cantidad    ⊙:mucho    ○:regular    △:poco    .:trazas

Minerales			Codigo																
			Quartz	plagioclase	albite	sericite	chlorite	lepidolite	kaolinite	halloysite	barite	calcite	siderite	magnesite	pyrite	hematite	fluorapatite	lutil	goethite
56	11357 R	Pelechuco	⊙		⊙	⊙	⊙												
57	11359 R	Pelechuco	⊙		⊙	⊙	⊙											△	
58	11084 MH	Pelechuco	⊙		⊙	⊙	⊙											.	
59	11361 R	Pelechuco	⊙		○	⊙	⊙											○	
60	11362 R	Pelechuco	⊙		○	⊙	⊙											△	
61	11460 LA	Hilo Hilo	⊙		⊙	⊙	⊙											○	
62	11461 LA	Hilo Hilo	⊙			⊙	⊙	⊙										○	
63	11462 LA	Hilo Hilo	⊙			⊙	⊙											○	
64	11238 OA	Hilo Hilo	⊙		⊙	⊙	⊙											△	
65	11239 OA	Hilo Hilo	⊙			⊙	⊙	⊙										○	
66	11085 MH	Hilo Hilo	⊙		⊙	⊙	⊙											○	
67	11086 MH	Hilo Hilo	○			⊙	⊙	⊙	⊙									○	
68	11087 MH	Hilo Hilo	⊙			⊙	⊙											.	
69	11806 ATZ	Hilo Hilo	⊙		⊙	○	○				.							.	
70	11807 ATZ	Hilo Hilo	⊙		○	⊙	⊙											.	
71	11808 ATZ	Hilo Hilo	⊙		⊙	⊙	⊙											.	
72	11809 ATZ	Hilo Hilo	⊙		○	⊙	⊙											△	
73	11810 ATZ	Hilo Hilo			⊙		⊙											○	
74	11811 ATZ	Hilo Hilo	⊙			○	⊙											.	
75	11088 MH	Hilo Hilo	⊙		⊙	⊙	⊙											△	
76	11089 MH	Hilo Hilo	⊙			⊙	⊙							.				.	△
77	11090 MH	Hilo Hilo	⊙		⊙	⊙	⊙											△	.
78	11463 LA	Hilo Hilo	⊙			⊙	⊙	⊙										○	
79	11464 LA	Hilo Hilo	⊙			⊙	⊙	⊙										○	
80	11240 OA	Hilo Hilo	⊙			⊙	⊙											.	
81	11241 OA	Hilo Hilo	⊙		○	⊙	⊙											△	
82	11363 R	Hilo Hilo	⊙				⊙									○			△
83	11364 R	Hilo Hilo	⊙			⊙	⊙											.	
84	11465 LA	Hilo Hilo	⊙		⊙	⊙	⊙			.								△	
85	11466 LA	Hilo Hilo	⊙		⊙	⊙	⊙											△	
86	11467 LA	Hilo Hilo	⊙			⊙	⊙	⊙										○	
87	11468 LA	Hilo Hilo	⊙		○	⊙	⊙							.				△	
88	11242 OA	Hilo Hilo	○		⊙	○	⊙											○	
89	11243 OA	Hilo Hilo	⊙		○	⊙	⊙						○					○	
90	11244 OA	Hilo Hilo	⊙			⊙	⊙	⊙										○	
91	11365 R	Hilo Hilo	⊙		○	⊙	⊙							.				△	
92	11366 R	Hilo Hilo						⊙			⊙			.					
93	11246 OA	Hilo Hilo	⊙		⊙	⊙	⊙											△	
94	11470 LA	Hilo Hilo	⊙		○	⊙	⊙											△	
95	11471 LA	Hilo Hilo	⊙		⊙	⊙	⊙											.	
96	11472 LA	Hilo Hilo	⊙			⊙	⊙	⊙						.				○	
97	11367 R	Hilo Hilo	⊙			⊙	⊙	⊙										○	
98	11368 R	Hilo Hilo	⊙		○	⊙	⊙							.				○	
99	11370 R	Hilo Hilo	⊙		○		⊙											△	
100	11473 LA	Hilo Hilo	⊙		○	⊙	⊙											△	
101	11474 LA	Hilo Hilo	⊙			⊙	⊙	⊙										○	
102	11475 LA	Hilo Hilo	⊙			⊙	⊙	⊙	⊙									○	
103	11476 LA	Hilo Hilo	⊙		⊙	⊙	⊙											△	
104	11477 LA	Hilo Hilo	⊙		○	⊙	⊙											.	
105	11478 LA	Hilo Hilo	⊙		⊙	⊙	⊙											△	
106	11479 LA	Hilo Hilo	⊙			⊙	⊙	⊙										○	
107	11480 LA	Hilo Hilo	⊙			⊙	⊙	⊙										○	
108	11482 LA	Hilo Hilo	⊙		⊙	⊙	⊙											○	
109	11483 LA	Hilo Hilo	⊙			⊙	⊙							△				△	
110	11484 LA	Hilo Hilo	⊙		○	⊙	⊙											○	
111	11814 ATZ	Hilo Hilo	⊙		⊙	⊙	⊙											△	

cantidad ⊙:mucho ○:regular △:poco .:trazas



卷末資料 6 流体包有物測定結果  
(均質化温度、塩濃度)

**Apéndice 6 Temperatura homogeneizada  
y salinidad de inclusión fluida**

# Resultada Temperatura homogeneizada y salinidad de inclusion fluida

Pelechuco

Sample No.	2-1		2-2		2-3		2-4		2-5		2-6		2-7		2-8		2-9		2-10		2-11		
	Host Minerals	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	
Number of inclusions	8	3	10	3	13	4	12	7	11	5	17	4	12	7	8	10	11	6	too small	9	3	3	
Low Th°C/wt%	164	3.5	160	5.4	217	8.3	156	19.2	263	2.6	162	14.9	155	13.7	153	2.1	177	0.5		106	17.7	108	17.7
High Th°C/wt%	291	15.8	272	21.2	315	16.5	327	22.6	370	15.6	318	21.2	197	16.0	288	22.0	319	21.3		203	20.8	203	20.8
Avg Th°C/wt%	225	10.8	242	13.7	258	13.1	198	21.3	326	5.9	222	18.6	172.0	14.9	205.2	16.8	257	9.7		155.8	19.7	155.8	19.7
Filling temperatures(Th°C) and NaCl in Solution (wt%)	164.0		160.1		217.0		156.3	22.1	262.6		161.9		162.4	15.0	153.4	17.7	177.2		too small			105.6	
1					236.8		156.4	21.7	273.1		168.6	21.2	161.0	16.0	165.4	16.6	196.6	20.6				112.2	
2					240.7	16.5	156.9	22.1	293.9	15.6	169.2		155.3		167.1	20.6	203.5					112.7	20.5
3					242.5		157.9	20.0	299.3		178.8	20.8	185.5	14.4	181.5		224.9					140.3	
4					245.9		180.8		322.4		179.2	14.9	189.9		189.9		271.2	21.3				164.0	
5					247.7	8.3	180.9		342.6	2.6	179.8		196.6		228.0	2.1	276.3	0.9				168.1	
6					249.0		201.0	22.6	349.0	3.7	184.8		189.2		268.0	16.9	277.9	8.9				194.4	
7					251.8	15.2	204.3		351.2	4.5	191.7		180.9		288.0	20.3	279.5	0.5				201.8	20.8
8					254.0		206.2		359.8	3.3	206.5	16.0	186.6	16.0	15.6	293.5	6.0					203.1	17.7
9					274.0	12.5	223.0		362.5		244.7	14.9	169.5	14.1	16.3	304.4							
10					292.2		230.8	19.2	370.1		246.3		161.5	13.7	22.0	318.6							
11					292.2		326.7	21.3			250.4	17.4	182.5		20.3								
12					314.8						255.6												
13											272.8												
14											283.6												
15											290.0												
16											317.6												
17																							
18																							
19																							
20																							
remark																							

\* :CO2 withFI

too small



## Resultada Temperatura homogeneizada y salinidad de inclusion fluida

Hilo Hlio(1)

Sample No. Host Minerals	3-1		3-2		3-3		3-4		3-5		3-6		3-7		3-8		3-9		3-10	
	11120MH	quartz	11863MH	quartz	11121MH	quartz	11124MH	quartz	11508LA	quartz	11130MH	quartz	11509LA	quartz	11920OA	quartz	11602RT	quartz	11138MH	quartz
Number of inclusions	7	5	9	3	11	2	10	4	17	3	9	3	12	6	12	2	15	11	15	3
Low Th°C/wt%	315	8.2	198	4.0	210	19.5	139	8.5	123	11.1	159.8	4.2	226	19.3	207	8.9	179	2.7	181	12.7
High Th°C/wt%	362	18.8	338	16.8	263	20.1	322	10.9	407	14.3	279.0	7.3	393	21.2	282	9.7	323	18.0	303	15.6
Avg Th°C/wt%	332.8	13.8	277.3	10.6	241.0	19.8	228.0	9.3	266.2	12.8	275.6	6.3	308.2	20.5	231.2	9.3	243.7	7.8	263.4	13.8
Filling temperatures(Th°C) and NaCl in Solution (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)	(Th°C) (wt%)
1	315.3	14.3	198.1	16.8	224.2		138.6		123.1		244.6	7.4	226.3	19.3	241.2	*	178.3		181.1	
2	317.7		221.8		231.2		162.2		159.8		255.7	4.2	236.5	19.7	217.2	*	194.4	17.9	221.8	13.1
3	320.6	11.2	249.1		260.2	20.1	208.8	8.5	187.8		263.2	7.3	254.1		224.0	*	199.5	*	236.1	
4	333.7	18.8	271.5		226.5		211.0	8.7	203.5		279.0		285.3		238.2	*	215.1	8.2	242.0	
5	336.9	16.7	282.9		249.1		224.5		248.9		296.4		286.7		216.0		217.7	3.9	245.2	
6	343.3	8.2	287.0		219.2	19.5	232.4		251.9		236.9	*	316.2		254.2	*	222.5		260.8	
7	362.3	8.2	319.0		263.4		234.9		255.9		235.7	*	317.4	21.2	223.3	*	223.0	9.2	276.0	
8			327.7	11.0	260.1		239.2		255.9	14.3	370.5		318.4	21.0	206.5		224.0	4.2	276.3	
9			338.3	4.0	257.5		306.5	9.0	258.0		298.0		332.8		281.6		224.0	2.7	276.5	
10					249.5		322.0	10.9	272.1	11.1			364.3		226.3	*	254.7	18.0	281.6	
11					209.7				277.3				367.9	20.6	214.0	*	278.9	*	284.0	12.7
12									284.3				393.0		231.3		279.3	*	286.5	15.6
13									305.9	12.9				21.2			317.7	*	286.9	
14									315.7								322.0	*	293.6	
15									330.2								323.0	*	303.1	
16									387.1										3.2	
17									407.3										6.0	
18																			4.0	
19																				
20																				
remark	CO2 with? * : CO2 withFI * : CO2 withFI * : CO2 withFI * : CO2 withFI																			

# Resultada Temperatura homogeneizada y salinidad de inclusión fluida

Hilo Hilo(2)

Sample No.	3-11		3-12		3-13		3-14		3-15	
	11514LA		11139MH		11142MH		11144MH		11147MH	
Host Minerals	quartz		quartz		quartz		quartz		quartz	
Number of inclusions	12	4	13	5			12	4	10	4
Low Th°C/wt%	165	5.2	170	14.7	248	16.7	204	19.5	281	18.7
High Th°C/wt%	282	9.5	318	20.6	315	21.1	320	21.4	363	20.8
Avg Th°C/wt%	214.5	6.7	242.1	16.2	283.2	19.4	269.3	20.5	310.9	19.5
Filling temperatures(Th°C)										
and NaCl in Solution (wt%)										
1	165.4		201.2		248.0	20.6	203.6	21.4	283.7	19.0
2	169.3		170.2		250.0		213.1		281.2	18.7
3	183.8		192.2		291.7		215.7		355.6	
4	195.6		202.7		300.5		254.8		320.3	
5	196.0		212.9	20.6	303.9		257.0	20.6	287.7	20.8
6	203.7		229.2		305.2	18.2	269.6		283.7	
7	218.1		234.0		309.3	20.4	281.2		294.6	19.3
8	232.0		234.9	19.3	314.7	21.1	296.0		314.8	*
9	235.1		267.8		315.4	16.7	301.3		325.0	
10	245.2	5.2	277.6	17.6			304.2	20.3	362.7	*
11	247.9		298.8				315.3			
12	282.4	8.5	310.0				320.3	19.5		
13		5.5	318.1	14.7						
14		6.6		18.6						
15										
16										
17										
18										
19										
20										
remark	*: CO2 withFI									



# Resultada Temperatura homogeneizada y salinidad de inclusión fluida

Aucapata

Sample No.	11		12		13		14		15	
	10833ATH		10840ATZ		11040MH		11047MH		11062MH	
Host Minerals	quartz		quartz		quartz		quartz		quartz	
Number of inclusions	13		16		10		13		18	
Low Th°C/wt%	153		133.6		154.8		149.0		125.4	
High Th°C/wt%	262		187		205		236		202	
Avg Th°C/wt%	214.5		167		181		187		173	
Filling temperatures(Th°C)	(Th°C) (wt%)		(Th°C) (wt%)		(Th°C) (wt%)		(Th°C) (wt%)		(Th°C) (wt%)	
and NaCl in Solution (wt%)	(Th°C) (wt%)		(Th°C) (wt%)		(Th°C) (wt%)		(Th°C) (wt%)		(Th°C) (wt%)	
1	153	133.6	154.8	5.1	149.0			125.4	6.1	
2	168.2	11.0	138.3		158.1		156.7	146.8	5.3	
3	190.4		146.8		174.1		160.0	148.3	6.6	
4	195.5		156.5	3.4	175.9	12.0	174.0		152.6	
5	200.9		165.8		180.3		174.3		161.0	
6	212.1	10.3	166.5		184.8	9.4	181.9	14.9	171.0	
7	217.4		167.9	10.3	189.3	7.8	191.4		171.6	
8	221.4	6.9	169.2	12.8	192.5	11.1	194.5		172.8	
9	231.4	9.0	169.4		195.6		195.6		174.2	
10	238.2	9.4	170.9	10.8	204.5	7.8	196.2	5.5	174.8	
11	244.8		171.3				207.3	8.4	174.9	
12	252.6		174.8	11.8			212.8		178.5	
13	262.2		181.1	13.2			236.2	4.2	183.2	5.8
14			184.6	9.8				5.9	190.7	6.5
15			186.9	11.6					181.9	
16			187.4						194.0	5.2
17									199.8	
18									202.3	
19										
20										
remark										

# Resultada Temperatura homogeneizada y salinidad de inclusión fluida

Tacacoma

Sample No.	1		2		3		4		5		6		7		8		9		10		
	11011MH	11021MH	11232OF	11307OA	11318OA	11405LA	11417LA	11419LA	11422LA	11429LAHV	11023MH										
Host Minerals	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	quartz	
Number of inclusions	too small	16	6	11	7	8	2	18	9	12	6	14	5	18	7	14	18	6	11	4	
Low Th°C/wt%		114	5.3	157	9.5	118	9.7	143	12.2	181	20.6	160	3.2	162	2.8	147	4.8	153	1.6	161	7.5
High Th°C/wt%		213	8.8	272	11.7	206	11.1	222	20.8	278	21.9	286	20.6	239	22.1	254	9.8	223	8.3	210	11.7
Avg Th°C/wt%		163	6.8	233	10.3	169	10.4	185	19.5	232	20.9	225	7.9	207	12.4	209	7.3	186	5.3	184	10.4
Filling temperatures(Th°C)																					
and NaCl in Solution (wt%)																					
1	too small	113.6	156.6	117.5	143.0	20.5	117.5	143.0	20.5	181.4	21.9	159.9	159.9	161.5	146.5	6.2	153.4	153.4	160.9	160.9	
2		121.4	7.7	205.8	147.9	20.4	146.9	147.9	20.4	211.0		182.0	182.0	175.8	158.7		154.1	154.1	163.2	163.2	
3		123.8	225.6	225.6	150.3	20.7	148.8	150.3	20.7	213.1		193.2	4.2	183.0	181.5		158.8	158.8	167.7	167.7	7.5
4		123.8	7.8	228.4	164.7	12.2	164.7	159.4	12.2	216.5		205.1	3.2	184.2	180.1	9.8	162.2	162.2	177.0	177.0	
5		130.7	8.8	229.9	170.6		170.6	184.8		222.7		206.7		185.4	183.5	7.0	172.4	172.4	180.6	180.6	
6		153.0		236.3	10.1	187.6		174.2	20.8	231.3		223.7	20.6	187.7	21.9	198.8	173.2	173.2	187.5	187.5	
7		159.4		240.7	9.5	200.1		174.6	20.3	234.2		227.9		190.9	199.9	9.3	180.1	180.1	190.1	190.1	11.7
8		160.5		251.7	10.1	206.2		176.9		239.2	21.0	228.9	4.9	199.4	22.1	206.4	183.3	183.3	193.5	193.5	
9		170.5		253.0	10.5			181.2	20.5	246.6		231.2		200.8	22.1	213.2	184.5	184.5	197.3	197.3	11.1
10		171.0		265.4				11.1	193.2	247.2		240.4	6.8	215.3	239.0	4.8	184.6	184.6	201.6	201.6	
11		171.6		271.8	10.9				194.2	267.1	20.7	243.9		222.1	5.0	246.8	186.6	186.6	209.8	209.8	11.3
12		191.9							197.3	278.4	20.7	261.2		222.9	247.3		201.7	201.7			
13		197.2							201.0		20.6	266.7		223.4	5.0	249.0	203.9	203.9			
14		201.3	5.9						204.3	20.6	20.7	285.7		228.9	8.1	254.0	205.3	205.3	8.3	8.3	
15		211.7	5.3						206.5					229.7			205.5	205.5	4.6	4.6	
16		213.1	5.5						218.6					233.8			206.5	206.5	7.3	7.3	
17									219.4					235.9	2.8		214.8	214.8			
18									222.0	19.2				239.4			222.7	222.7			
19																					
20	too small																				

記事



卷末資料 7 放射年代測定結果  
(K-Ar 法)

**Apéndice 7 Datación por el método K/Ar**

## Results

6 samples were submitted for mineral separation and K-Ar dating

Biotite was separated for samples 11237 BC, 11008 MH and 11004 MH. On the other three samples biotite was scarce to absent thus we processed them for sericite.

Sericite separate was obtained only for sample 11231 OF. Different separation technique was applied to obtain sericite for samples 11230OF and 11315 OF. No sericite was obtained for sample 11230OF. Minor sericite was obtained for sample 11315 OF. This amount is not enough to perform dating.

According your instruction the samples 11230 OF and 11315 OF are processing as whole rock samples.

The K concentration was performed by ICP.

The argon analysis was performed using the isotope dilution procedure on noble gas mass spectrometer.

Sample	%K <sup>40</sup>	Ar <sub>rad</sub> , nl/g	% <sup>40</sup> Ar <sub>air</sub>	Age, Ma
11230 OF whole rock	0.014	0.348	79.1	559±26*
11231 OF sericite	3.75	12.26	8.1	83.8±2.3
11237 BC biotite	3.38	23.65	2.1	175.0±4.9
11008 MH biotite	6.50	45.68	1.6	175.5±4.9
11004 MH biotite	4.15	23.10	2.2	140.4±3.9
11315 OF whole rock	0.45	2.06	49.1	116.4±3.4

\* Probably sample content excess argon, the concentration of K is very low.