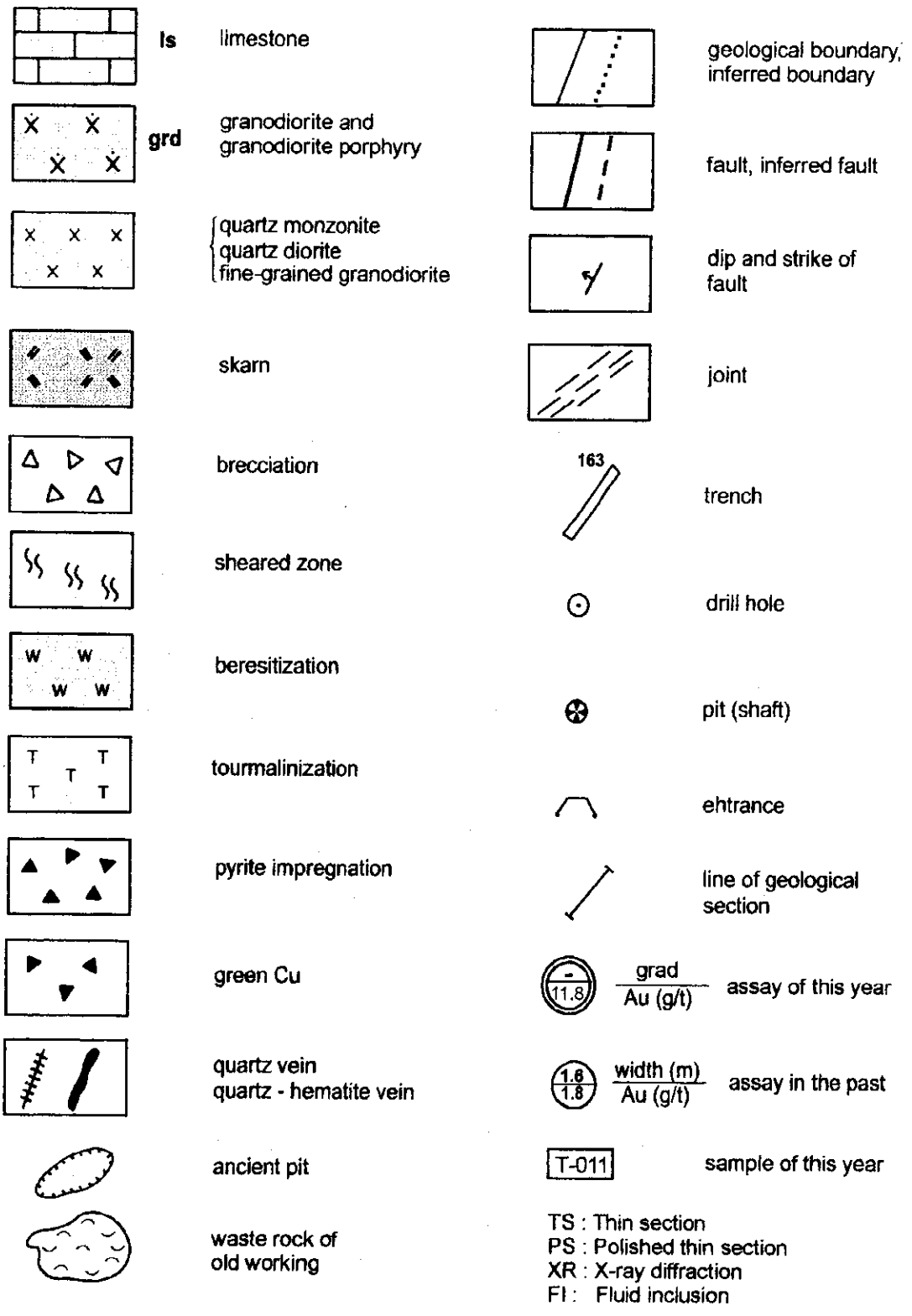


Fig. II-2-4 Legend for Geological Maps in the Turpac-Tushty District

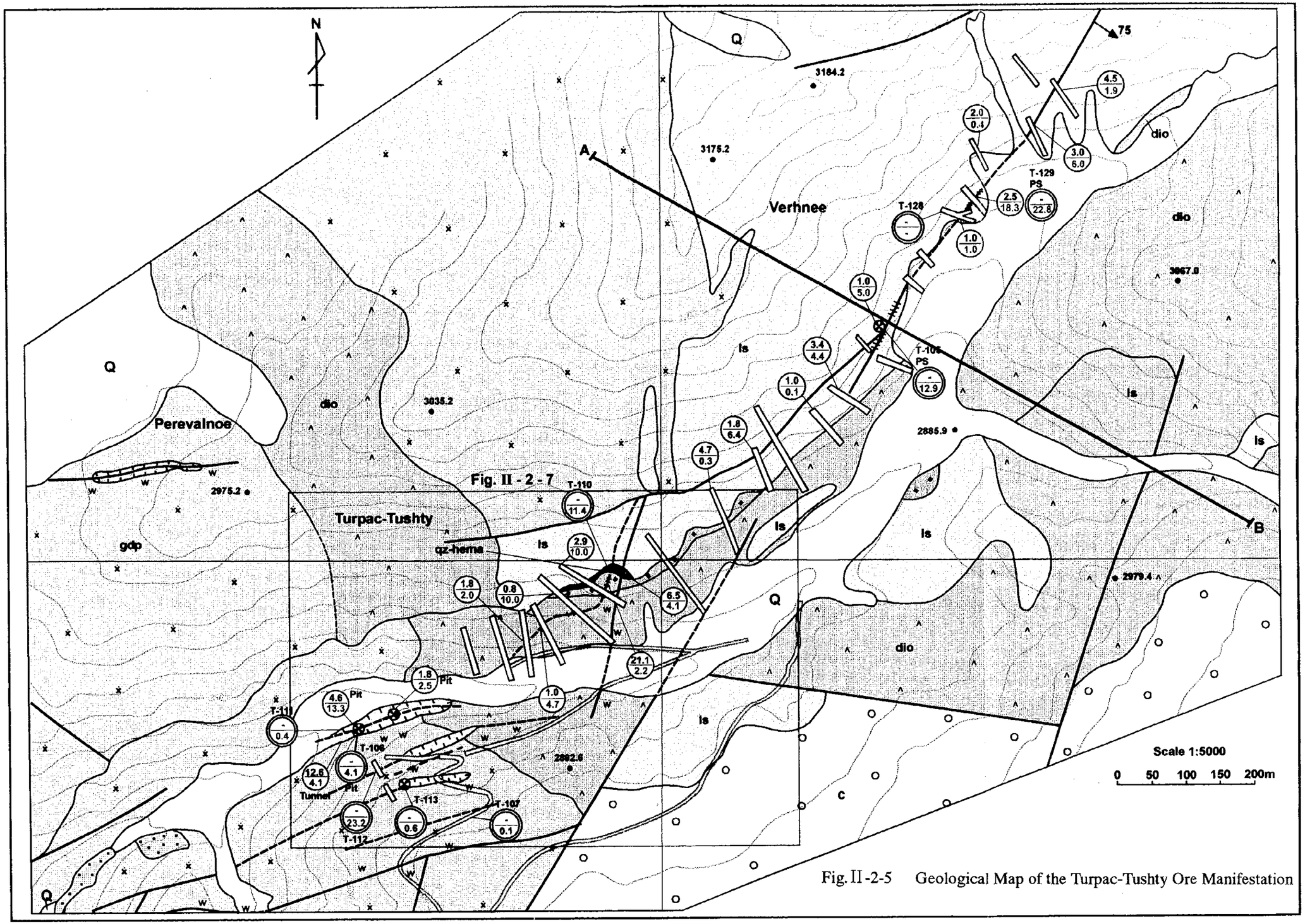


Fig. II-2-5 Geological Map of the Turpac-Tushty Ore Manifestation

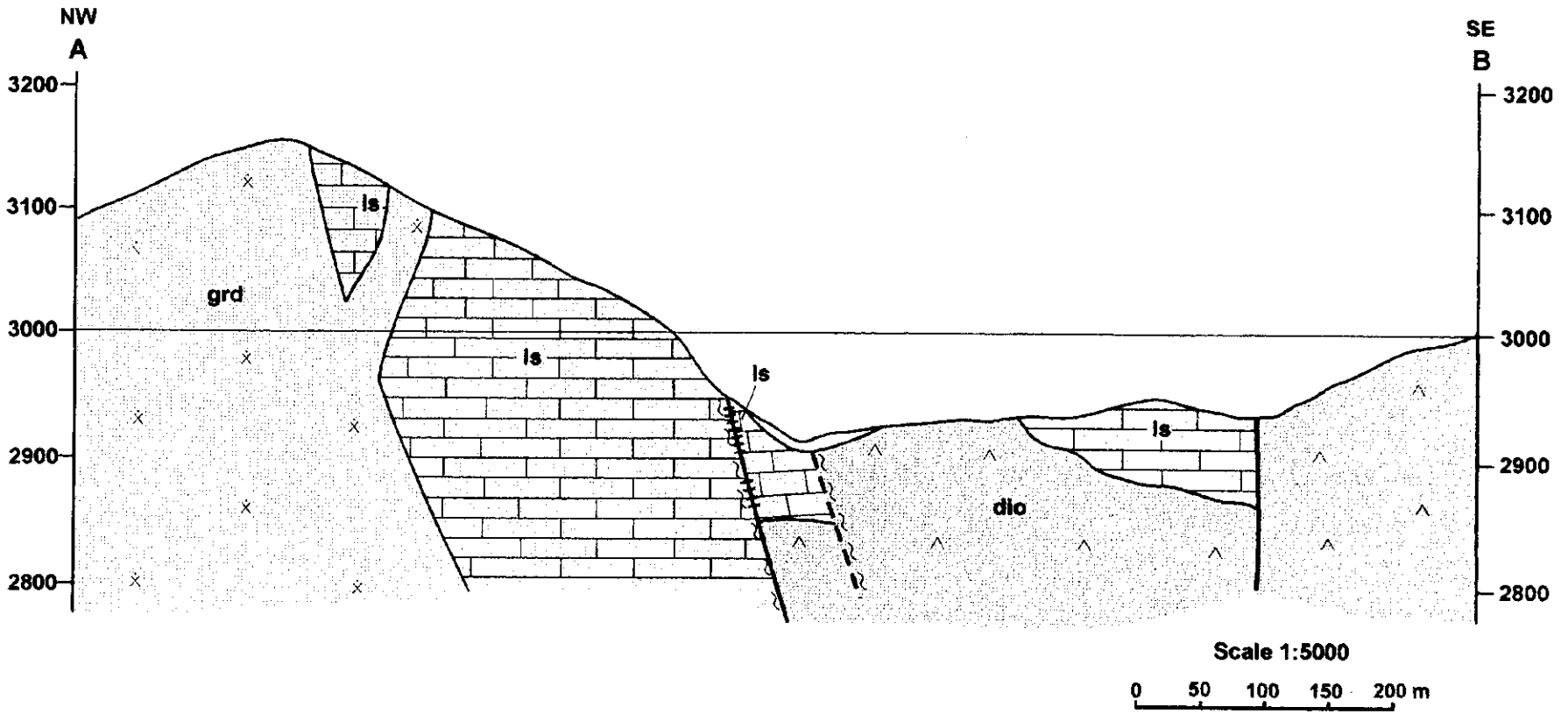


Fig. II-2-6 Geological Cross Section of the Turpac-Tushty Ore Manifestation (A-B)

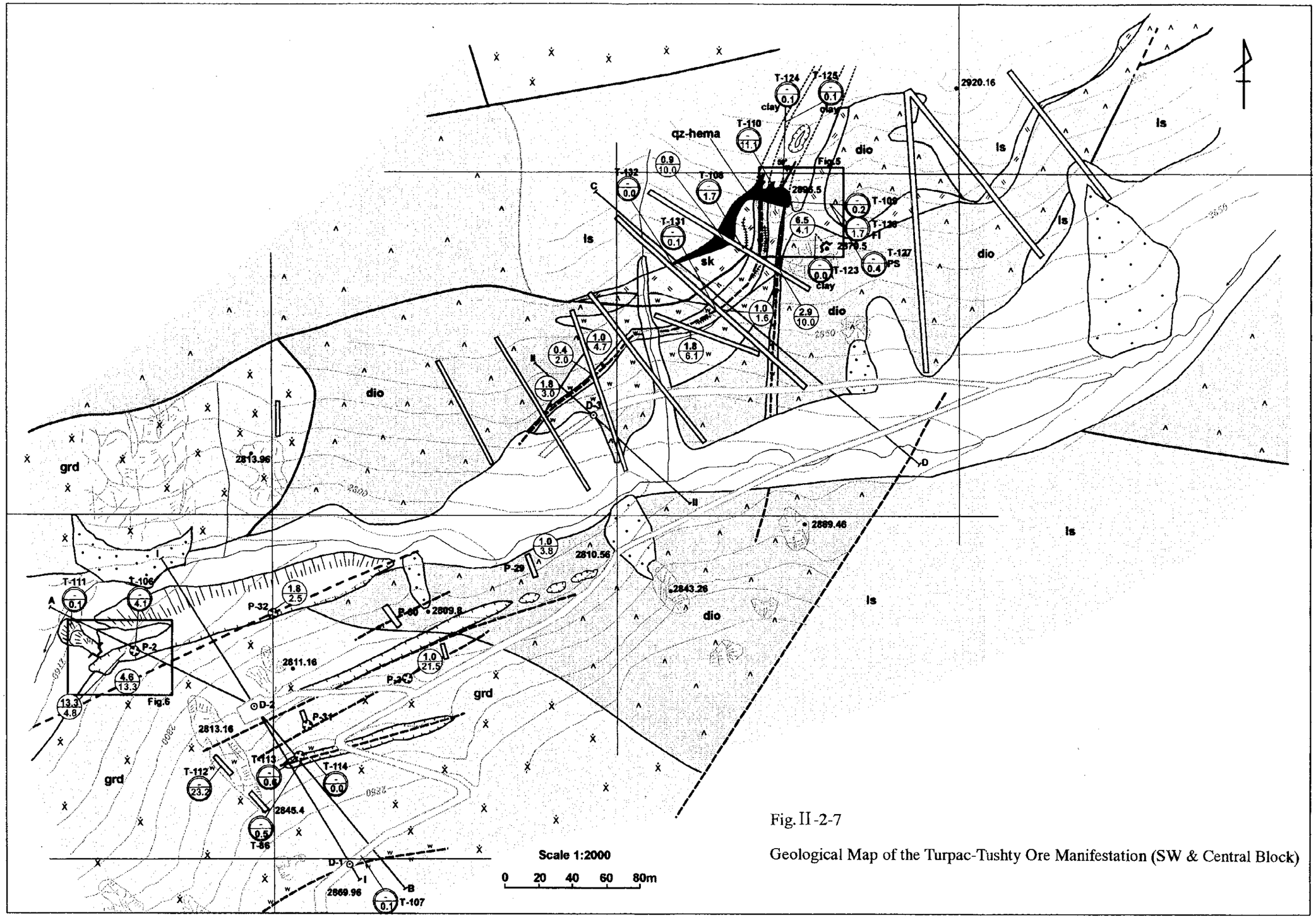


Fig. II-2-7

Geological Map of the Turpac-Tushty Ore Manifestation (SW & Central Block)

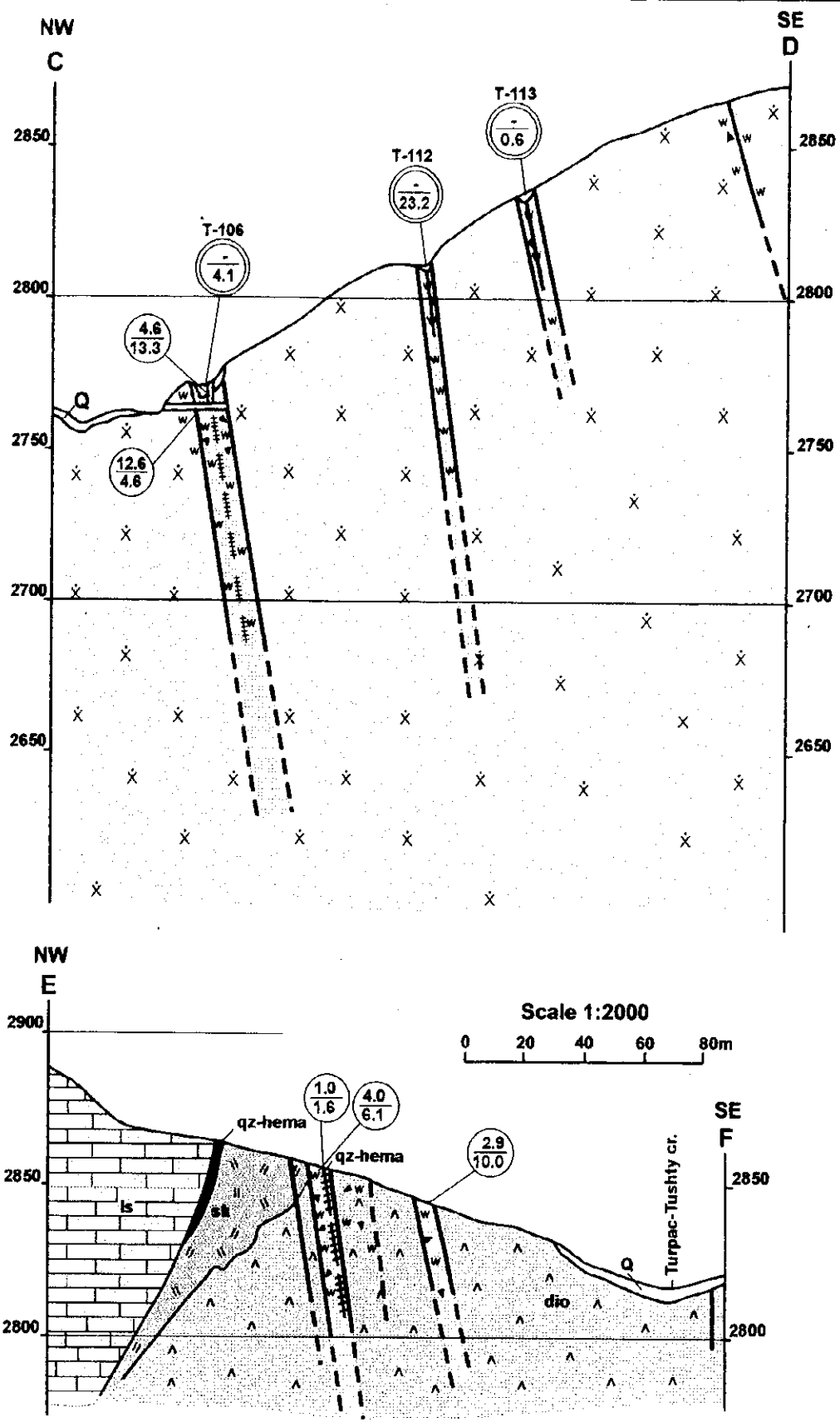


Fig. II-2-8 Geological Cross Section

of the Turpac-Tushty Ore Manifestation (C-D, E-F)

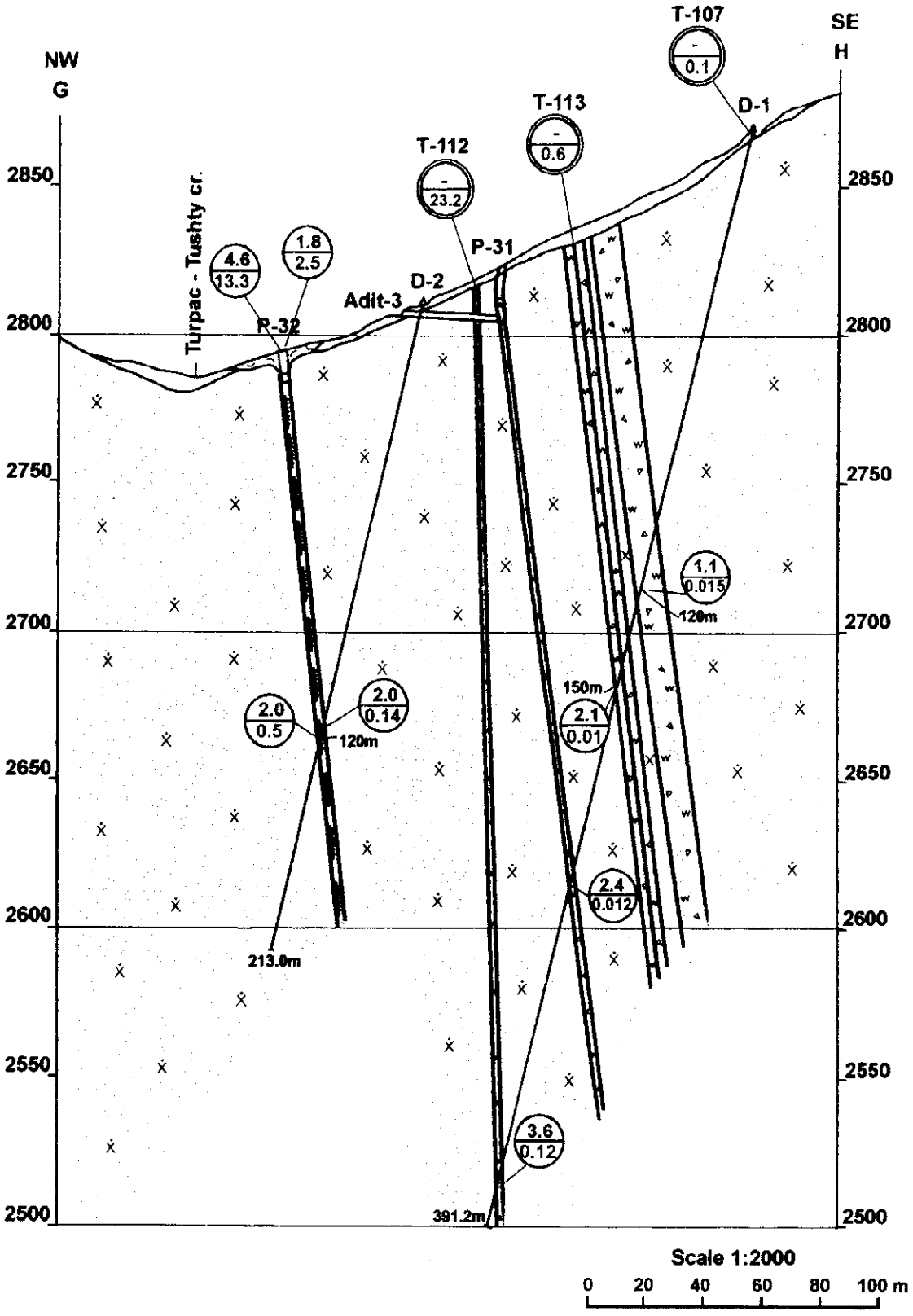


Fig. II-2-9 Geological Cross Section along Old Drillholes in the Turpac-Tushty Ore Manifestation (G-H)

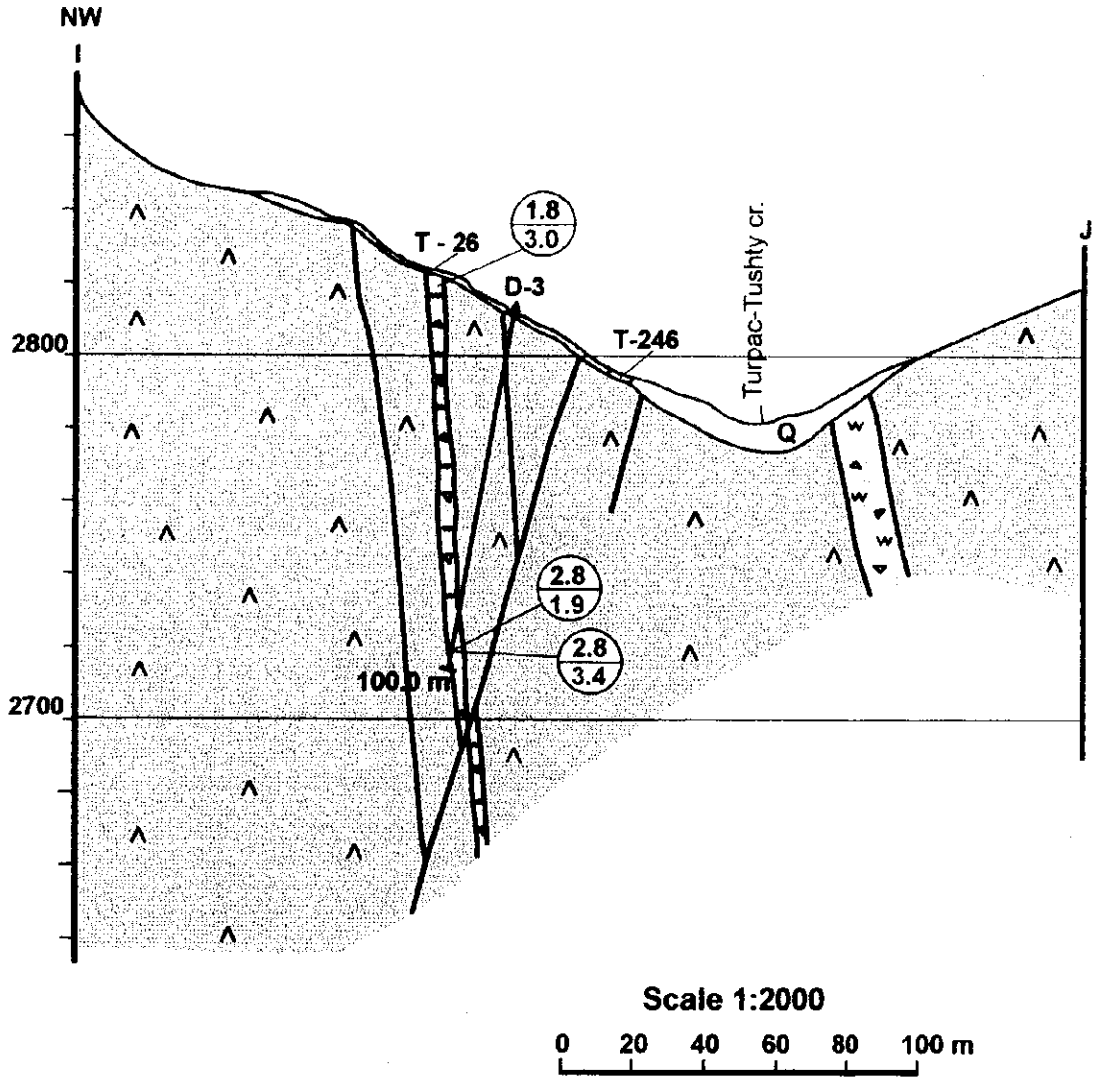


Fig. II-2-10 Geological Cross Section along Old Drillholes in the Turpac-Tushty Ore Manifestation (I-J)

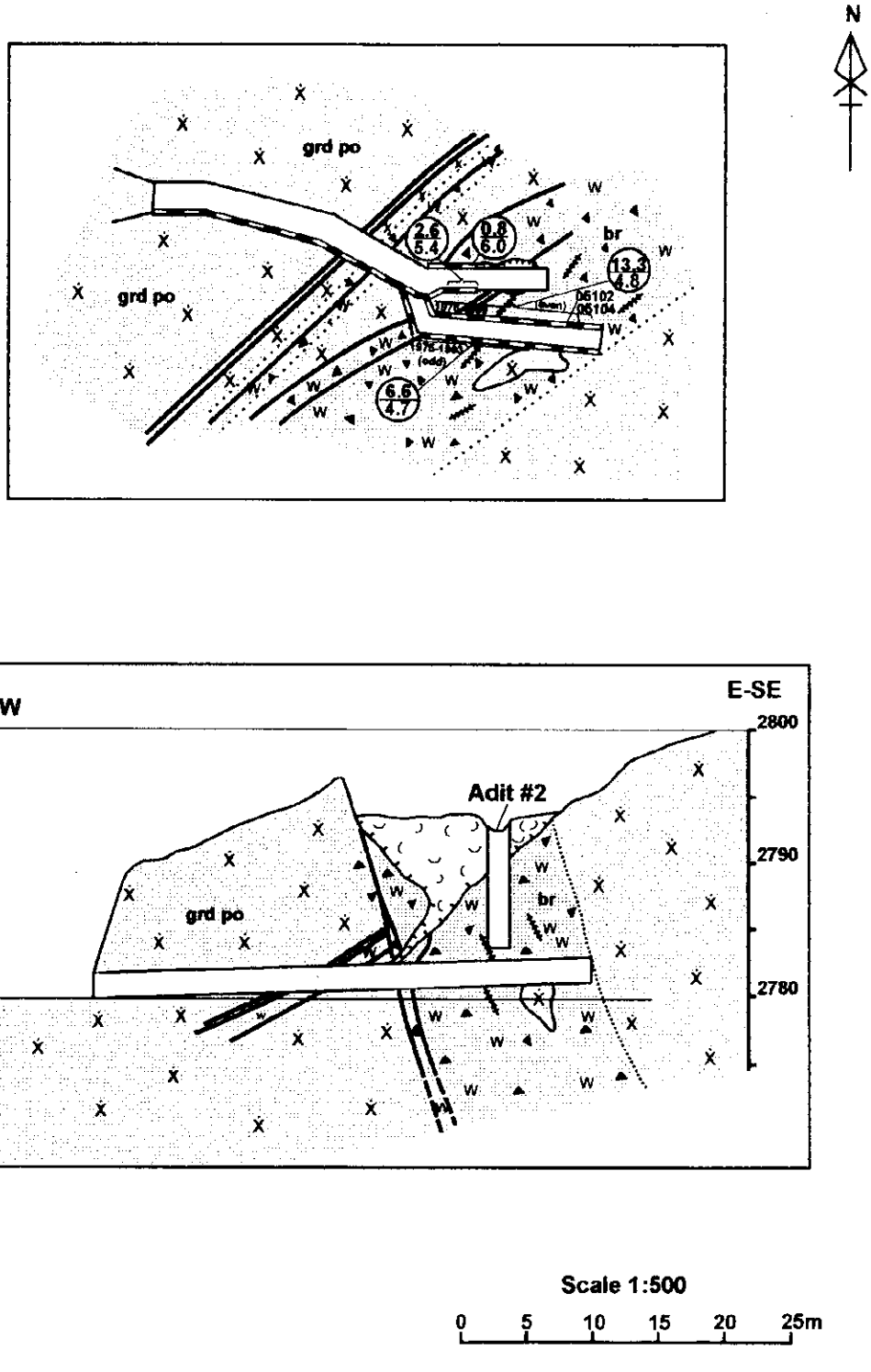
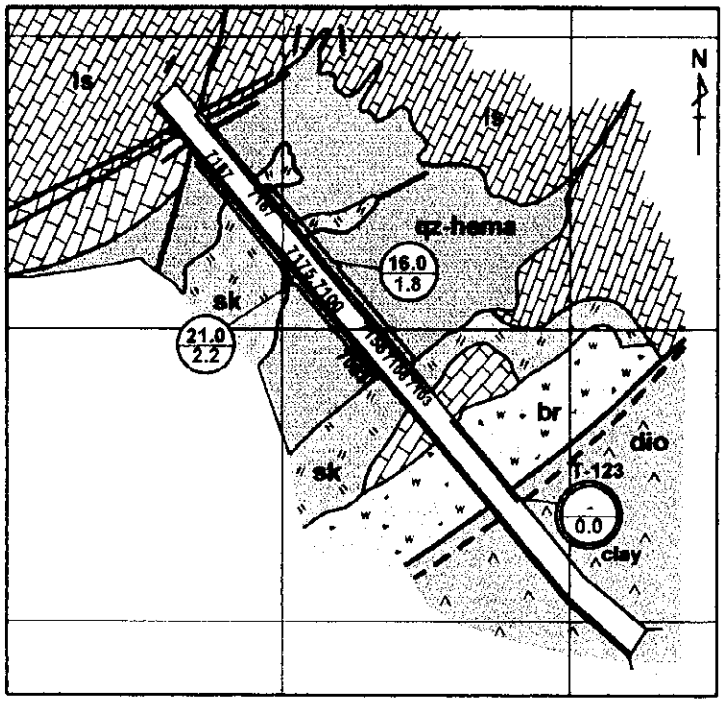


Fig. II-2-11 Geological Map of Old Tunnel (No.4)

in the Turpac-Tushty Ore Manifestation



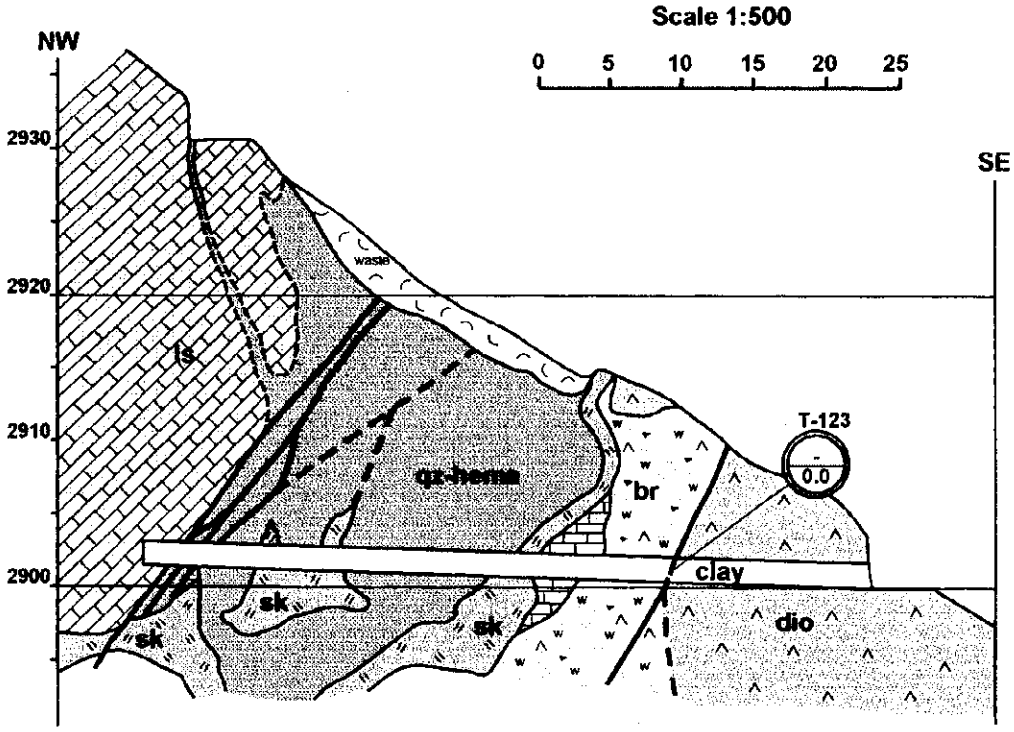


Fig. II-2-12 Geological Map of Old Tunnel (No.10)

in the Turpac-Tushty Ore Manifestation

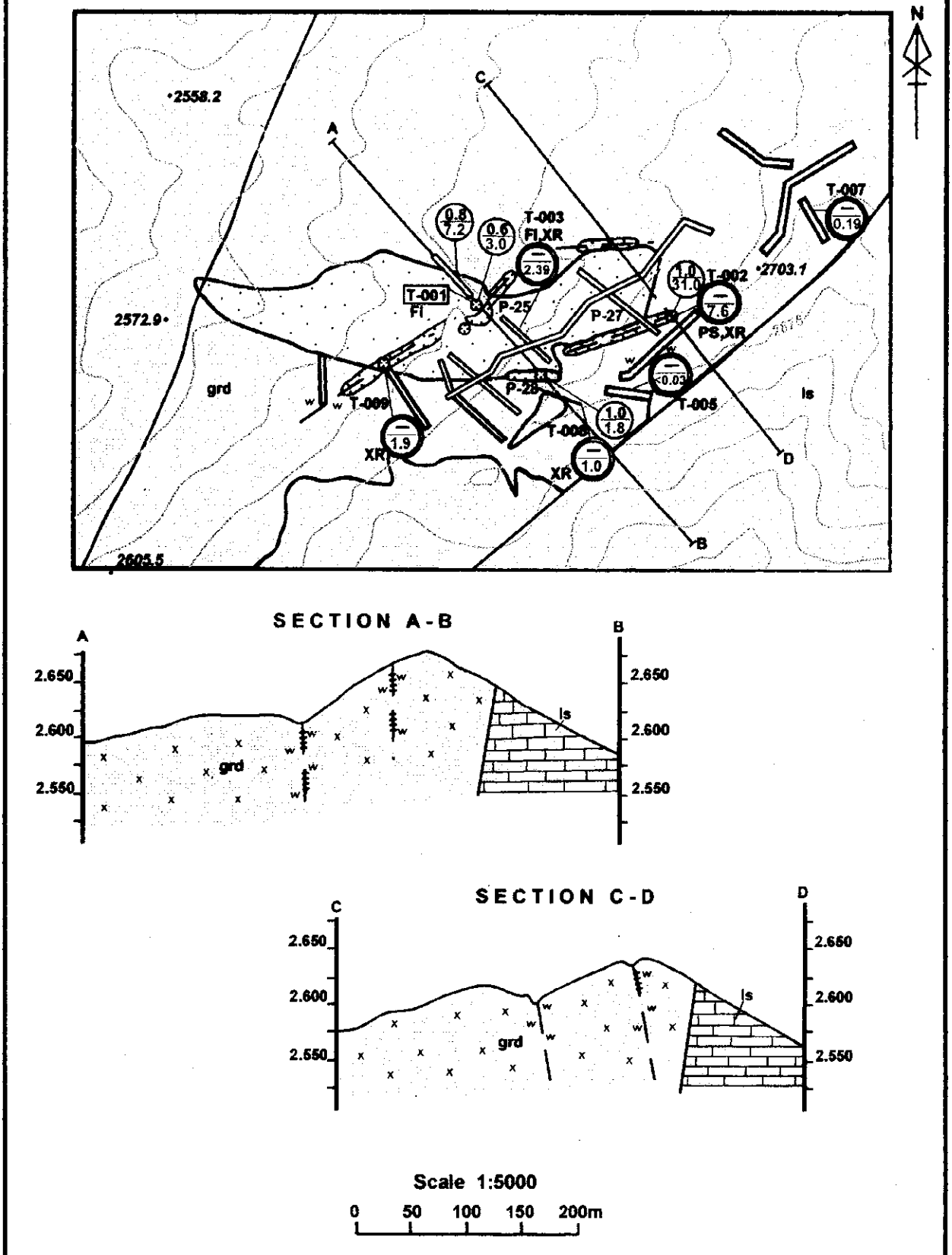
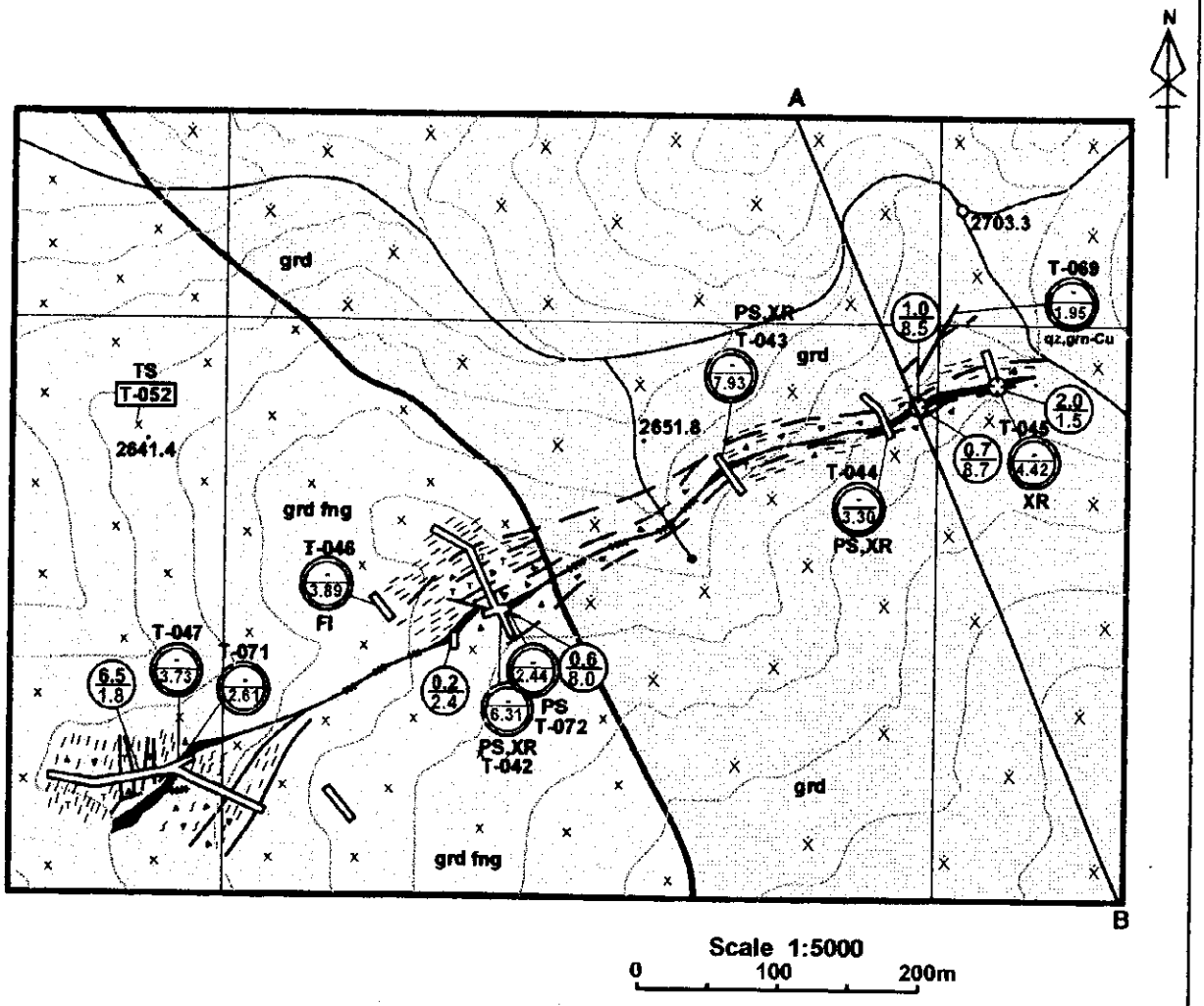


Fig. II-2-13 Geological Map of the Ak-Kamou Ore Manifestation



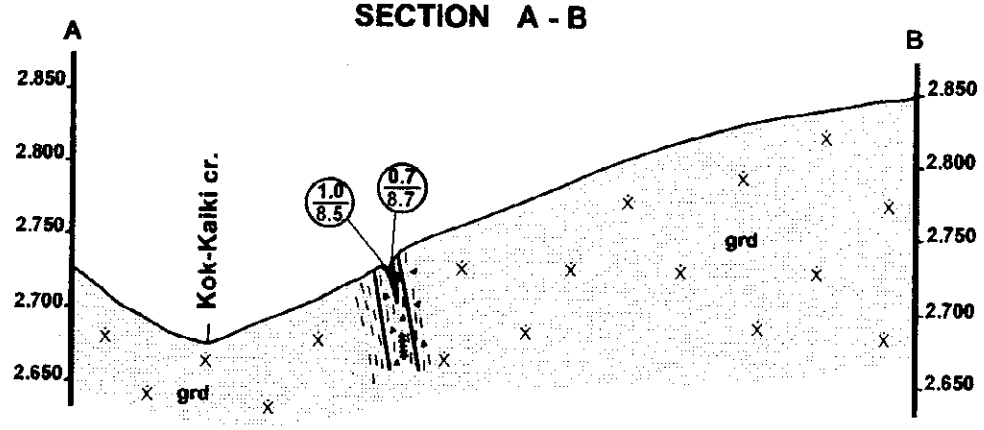


Fig. II-2-14 Geological Map of the Kok-Kaiky Ore Manifestation

PART III CONCLUSIONS

CHAPTER 1 CONCLUSIONS

The Kichi-Sandyk district was selected as a promising area for the gold-copper ore deposits on the basis of the past Kyrghyz-side survey results. The potential ore reserves (C2+P1) in the central and the northern mineralization zones of the district were estimated in all to be 33 tons of gold (average Au-grade: 3.85g/t). However, the result of the present two-year survey shows that the potential ore reserves in the central mineralization zone do not exceed 1 ton of gold and the possibility of the existence of promising gold deposits in the zone is rather low. On the other hand, the potential ore reserves in the northern mineralization zone are revealed to be only about 1 ton of gold but there remains in this zone a possibility that the high-grade gold ore exists along the ore-bearing horizon which is assumed to occur in a wide area.

In the Turpac-Tushty district, possible ore reserve (P1) of 695 thousand tons and gold quantity of 2.9 tons (average Au-grade: 4.22g/t) were estimated by the Kyrghyz side. The result of the second year survey confirms an existence of high-grade ores at the Turpac-Tushty and the Ak-Kamou ore manifestations and suggests a possibility that the high-grade ore bodies, even though of a small scale, exist in both the manifestations.

1-1 Kichi-Sandyk District

1-1-1 Characteristics of geological structure and mineralization

1) Geology

The geology of Kichi-Sandyk district mainly consists of crystalline limestone of Late Cambrian to Early Carboniferous (Visean) age and the Permian granodiorite porphyry (Chalmansay complex) intruding the limestone. Conglomerate of unknown age covers all of the above rocks.

2) Geological structure

The contact plane between calcareous sediments and granodiorite porphyry gently dips north or west and layered skarns often occur near the contact.

Topographic feature indicates the presence of parallel faults trending NW- SE. A number of fissures and joints which have the same trends and a steep southward dip were developed in the central mineralization zone. Cu-Au-bearing vein-like skarns were formed along these fractures.

3) Mineralization

(1) Types of mineralization

Two types of mineralization described below are recognized in the survey district.

① Endoskarn: As mentioned above, a number of fissures and joints striking NW -SE and steeply dipping SW were formed within granodiorite porphyry. These endoskarns occur in the central mineralization zone and, also, below the layered skarns in the northern mineralization zone.

② Exoskarn: Layered skarns were formed in limestone at the contact with intrusives. This type of skarn occurs in the northern mineralization zone.

(2) Size of ore body

Width of each vein-like skarns is in an order of 10～100 cm and they form together several Au-Cu ore bodies with the width of a few meters to a maximum of 25 m. Ore bodies seem to be of stockwork type as a whole, trending NW-SE parallel to the major fracture system. The extent of the central mineralization zone as an aggregate of Au-Cu ore bodies is presumed to be 300 m by 300 m. The downward extension of the mineralization zone is inferred to be in an order of 10-20 m with maximum of 30 m.

Outcrop of the layered skarns extends intermittently for 2 km in the NW-SE direction along the contact of limestone and granodiorite porphyry. The layered skarns are presumed to continue to a considerable depth and their width is in an order of 10-20 m.

(3) Model of mineralization

From the above-mentioned facts, the following model on the mineralization of this district is proposed.

① As a result of intrusion of the granodiorite porphyry into the limestone, layered skarns were formed along the contact plane. At the same time, the vein-like skarns were formed along the fractures of the NW-SE system in the granodiorite porphyry, mostly within the distance of 10～20 m from the contact plane.

② Ore solution passed along the fractures of the NW-SE system and deposited copper and gold ores in the pre-existing skarns.

③ The Kichi-Sandyk district was then tectonically deformed and was divided into small blocks by thrust faults.

④ In the central mineralization zone, the vein-like skarns were exposed on the surface due to intense erosion of limestone which was lying on the intrusives with gently dipping boundary. Reconcentration of copper and gold by meteoric water

led to the formation of a secondary enrichment zone characterized by green copper minerals at shallow depth.

1-1-2 Potential for ore deposits

1) Central mineralization zone

The results of the drilling survey show that the underground mineralization is weaker than the surface mineralization (3 ore bodies; total 4,944 m², 1.94 g/t·Au) srevealed by the last year's trenching survey.

- Potential ore reserves and grade

(Ore reserves) Area 4,944 m^2 × Depth 30 m × Specific gravity 2.6
=385,630 t

(Gold content) Ore reserves 385,630 t × Grade 1.94 g/t= 748 kg

2) Northern mineralization zone

Though the grade of layered skarns is presumed to be 1-2 g/t Au, there is the possibility of existence of high-grade ore bodies because the previous exploration was done in a very limited area of the vast mineralization area.

Since the ore body of this type is a gently dipping stratiform, underground mining method will probably be adopted in case of mining. Considering poor infrastructure of this district for the transportation and electric power, the mineable ore grade is required to be at least 6-8 g/t Au

- Potential ore reserves and grade

(Ore reserves) Thickness 10 m × Width 100 m × Length 1,500 m ×
Specific gravity 2.6 × Percentage of existence 20% = 780,000 t

(Gold content) 780,000 t × 1 g/t= 780 kg Au (in case of 1 g/t Au)
780,000 t × 2 g/t= 1,560 kg Au (in case of 2 g/t Au)
780,000 t × 6 g/t= 4,680 kg Au (in case of 6 g/t Au)

1-2 Turpac-Tushty District

1-2-1 Characteristics of geological structure and mineralization

1) Geology

The Carboniferous limestone and the Carboniferous to Permian intrusive rocks such as granodiorite and diorite are widely distributed in the survey area. Tertiary sediments cover all these rocks.

2) Geological structure

The limestone occurs as a roof on the intrusive rocks.

A prominent fault of the NE-SW direction runs from the Turpac-Tushty ore manifestation to the Ak-Kamou ore manifestation resulting in considerable displacement of Tertiary sediments. The faults trending E-W and N-S are also recognized.

The NW-SE lineament extending from the Kichy-Sandyk district was selected by satellite image analysis in the first year. The results of this year's survey show that a series of small diorite stock intruded along the above lineament but no significant fault was found.

3) Mineralization

A number of ore manifestations are distributed in the survey area. Major ore manifestations are located in Turpac-Tushty, Ak-Kamou, Kok-Kaiky, Jety-Zinden, Perevalnoe and Bismutovoe.

Mineralization in the district is classified into the following three types.

① Skarn-type mineralization: Skarns occur along the contact of limestone roof and intrusives with 5-30 m thickness. They are composed of garnet, clinopyroxene, and wollastonite, and accompanied with gold-copper mineralization and, in part, polymetalic mineralization. These ore manifestations are widely distributed on the surface. However, its thickness is thin and metal grade is low, so it is hard to expect a promising mineral deposit.

② Vein-type mineralization: Gold-copper mineralization occurs in association with major faults of NE-SW trend and subordinate faults of ENE-WSW trend. Pyrite-quartz-sericite vein (so-called beresitized vein) and hematite-quartz vein, both in association with the faults of ENE-WSW trend, as well as the breccia-like veins in association with fault-fracture zone of NE-SW trend often accompany a copper-gold mineralization. Vein-type ore manifestation is characterized by beresitized vein or hematite-quartz vein where high-grade ores over 10 g/t Au are often detected.

③ Placer-type mineralization: Placer gold deposits occur in Tertiary conglomerate and Quaternary sand and gravel beds. The latter is said to have been mined long ago.

1-2-2 Potential for ore reserves

As a result of this survey, it is concluded that small but high-grade vein-type ore deposits may be expected in both the Turpac-Tushty and the Ak-Kamou ore

manifestations.

Kyrgyzstan side has previously estimated 695,000 t of possible ore reserves (P1) with 2.9 t Au (average grade: 4.22 g/t) for the Turpac-Tushty ore manifestation. In this survey, it is not sufficient up to now to make an estimation of the potential ore reserves. If assuming that the potential ore zone in the Turpac-Tushty ore manifestation has 2 km length, 2 m width, 100 m depth, 5 g/t Au and 30% rate of existence, 0.7 t of gold reserves may be estimated.

We recommend that further exploration to confirm potential of ore reserves be conducted.

CHAPTER 2 RECOMMENDATIONS FOR THE PHASE III SURVEY

1) In the northern mineralization zone of the Kichi-Sandyk district, the skarn ore body (layered skarn) is inferred to continue to the deep. It is recommended to clarify the extent of the mineralization zone by the drilling survey to the deep in the northwestern direction and to confirm the possibility of the existence of the high-grade ore in order to obtain information necessary for the judgement on future surveys.
2) In the central mineralization zone of the Kichi-Sandyk district, the ore body (vein-like skarn) is of low grade and a small scale, so it is not a worthy of mining if independent. Accordingly, a necessity for further detailed survey in this zone is poor at present.
3) In the Turpac-Tushty district, high-grade ore bodies are expected to present in the Turpac-Tushty and the Ak-Kamou ore manifestations. It is recommended to carry out the drilling survey to the deep from the surface manifestation and to confirm the actual state of mineralization. Priority of exploration for these manifestations is low because the ore reserves are estimated to be small.

References

1. Tectonic Map of the Sandalash-Chatkal Ore Region, 1977, scale 1:100,000
2. Geological & Geophysical Sections, Kichi-Sandyk District, 1977, scale 1:5,000
3. Map of Schems Pk, drawn upon the Data of the Combined Profiling Method (CPM), Kichi-Sandyk District, 1977, scale 1:5,000
4. Map of the Results of Geophysical Survey, Projected on the Schematic Geological Basis, Kichi-Sandyk District, 1977, scale 1:5,000
5. Map of the Abnormal Magnetic Field (Isoline Z), Kichi-Sandyk District, 1977, scale 1:5,000
6. Scheme of Sampling on the Kichi-Sandyk Gold Deposit, Centralny District (No.1), 1977, scale 1:5,000
7. Scheme of Sampling on the Kichi-Sandyk Gold Deposit, Centralny District (No.2), 1977, scale 1:5,000
8. Scheme of Sampling on the Kichi-Sandyk Gold Deposit, Centralny District, 1977, scale 1:200
9. Schematic Geological Map of the Kichi-Sandyk Gold Deposit Centralny District, 1977, scale 1:1,000
10. Report on Prospecting-revision Works on Sandalash-Chatkal Ore District, 1973 – 1976 (Kichi-Sandyk Geological Party), Volume-1, Text of Report

Appendices

LIST OF APENDICES

No.	Sample No.	Locality: District or Drill Hole	Locality: Place or Depth	Sample Name	Grade	Primary minerals: Qz	Pl	Kf	Bi	Ms	Hb	Cpx	Opx	Mt	Ilm	Sph	Zr	Ap	To	All	Secondary minerals: Qz	Pl	Ser	Chl	Ep	Cal	Ga	Cpx	Wol	Prh	Act	Sph	Lc	Py	Cp	Hm	Gt	Ap
1	K 1 49.7	MJKK-1	49.7m	Skarnized granodiorite porphyry	C	◎	◎	△																·					○		○		△							
2	K 1 94.2	MJKK-1	94.2m	Silicified skarn	C																◎					○	△			△	○			·	·			
3	K 3 109.1	MJKK-3	109.1m	Clinopyroxene skarn	C	○	◎	△																				○			○		△		·				·
4	K 5 74.7	MJKK-5	74.7m	Clinopyroxene-ga skarn	A	○	◎	△	○		○			·												○	◎	○			○				·	·			
5	K 6 67.5	MJKK-6	67.5m	Clinopyroxene-ga skarn	A		○														△					○	◎	○						·		·	·		
6	K 6 209.5	MJKK-6	209.5m	Conglomerate	E				◎												△		△	△		◎								△			·		
7	K 7 38.8	MJKK-7	38.8m	ga-wollastonite skarn	A																					○	△		◎		△							
8	K 7 43.3	MJKK-7	43.3m	Clinopyroxene-ga skarn	A																△					○	◎	○	△										
9	K 7 50.2	MJKK-7	50.2m	Wollastonite-ga skarn	A																○					○	◎	△	○										
10	K 7 54.2	MJKK-7	54.2m	Wollastonite skarn	C																○					○	△		◎										
11	KT 1 3	Kichi-Sandyk	Trench I	Skarnized granodiorite porphyry	D	○	◎	○	○		○			·		·	·	·									·	○		△								
12	KT 2 21	Kichi-Sandyk	Trench II	Skarnized granodiorite	D	○	◎	△	○		○					·	·	·						·				○		△									
13	KT 3 11	Kichi-Sandyk	Trench III	Clinopyroxene-ga skarn	A																△					○	◎	◎						·	·	·	·		
14	R 1 28	Kichi-Sandyk	Road R-1	ga skarn	A																			·		○	◎									·	·		
15	R 1 49	Kichi-Sandyk	Road R-1	Skarnized granodiorite	D	○	◎	○	△		○					·	·	·					△						△							·	·		
16	R 1 70	Kichi-Sandyk	Road R-1	Clinopyroxene-ga skarn	A																·					○	◎	○			·					·			
17	T - 012	Turpac-Tushty	Bismutovoe	Granodiorite porphyry	E	◎	◎	○	○		○			△		·	·	·					·	△	△														
18	T - 026	Turpac-Tushty	Bismutovoe W	Lamprophyre	E		○				○														○							○		△		△	·		
19	T - 029	Turpac-Tushty	Bismutovoe W	Granodiorite porphyry	E	△	◎	○	○		○			△				·						△	△										·		·		
20	T - 031	Turpac-Tushty	Jety-Zindan E	Granodiorite	E	○	◎	○	○		○			·									·	△	△														
21	T - 034	Turpac-Tushty	Jety-Zindan S	Granodiorite porphyry	E	○	◎	○	○		○			△		·	·	·						·	·														
22	T - 052	Turpac-Tushty	Kok-Kaiky	Tourmaline quartz vein		◎												·	○				·																
23	T - 062	Turpac-Tushty	Kok-Kaiky E	Granodiorite	E	○	◎	○	○		○			·		·	·	·					·	·														·	
24	T - 064	Turpac-Tushty	Otovalnoe	Quartz monzonite	E	○	◎	◎	○		○	○	○	△			·	·					·									△							
25	T - 067	Turpac-Tushty	T-T cre. D-str.	Fine-grained granite	E	◎	○	◎	△	·				△		△	·			·			·	△															
26	T - 073	Turpac-Tushty	Otovalnoe	Diorite porphyry	E	△	◎				○				△		·	·					·		○							△		·					
27	T - 082	Turpac-Tushty	Perevalnoe	Granodiorite	E	○	◎	○	○		△	·		△			·	·					·	·	·														
28	T - 101	Turpac-Tushty	Bismutovoe N	Granodiorite	E	◎	◎	○	○		○			△		△	·						·	△															
29	T - 115	Turpac-Tushty	Jety-Zindan E	Granodiorite	E	○	◎	○	○			△		△			·	·					·																
30	T - 133	Turpac-Tushty	Otovalnoe NW	Diorite porphyry	E	△	◎	△	△		○	△		△				·							△	△						△			△				

[Abbreviations] cre. : creek, str. : streem

Act : actinolite, All : allanite, Ap : apatite, Bi : biotite, Cal : calcite, Chl : chlorite, Cp : chalcopyrite, Cpx : clinopyroxene, Ep : epidote, Ga : garnet, Gt : goethite, Hb : hornblende, Hm : hematite, Ilm : ilmenite, Kf : K-feldspar, Ms : muscovite, Mt : magnetite, Lc : leuoxene, Opx : orthopyroxene, Pl : plagioclase, Prh : prehnite, Py : pyrite, Qz : quartz, Sph : sphene, Ser : sericite, To : tourmaline, Wol : wollastonite, Zr : zircon, Opx : orthopyroxene, Pl : plagioclase, Prh : prehnite, Py : pyrite, Qz : quartz, Sph : sphene, Ser : sericite, To : tourmaline, Wol : wollastonite, Zr : zircon

[Legend]

◎ : Abundant, ○ : Common, △ : Poor, · : Rare

Grade : grade of skarnization, A ; high, B ; moderate, C ; low, D ; very low, E ; none

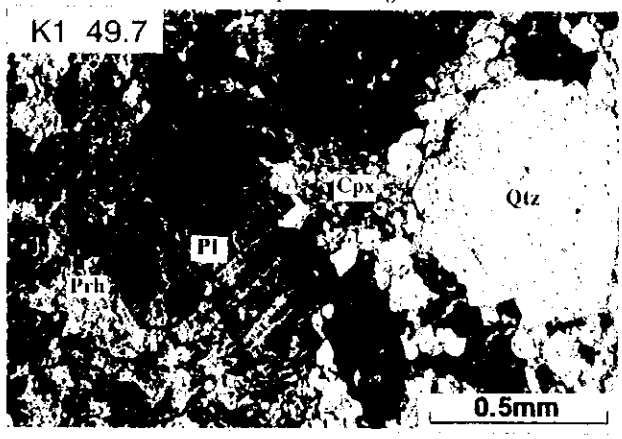
[Primary/Secondary]

Primary=igneous origin, Secondary=hydrothermal or sedimentary origin

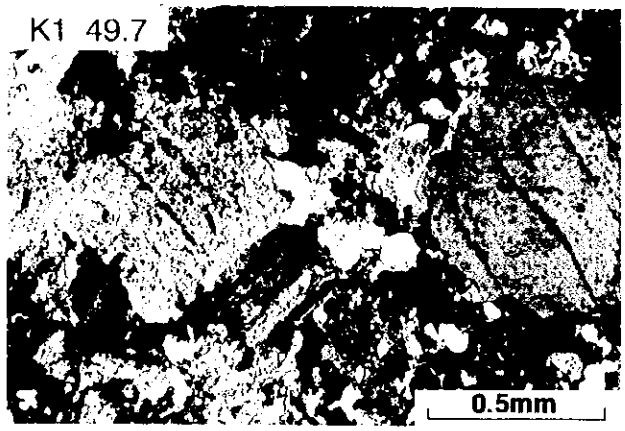
Appendix 1 Result of Microscopic Observations of Thin Sections

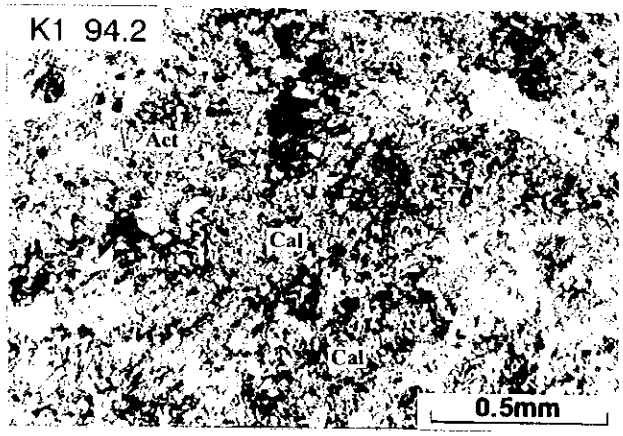
Appendix 2 (1) Photomicrographs of the Thin Sections

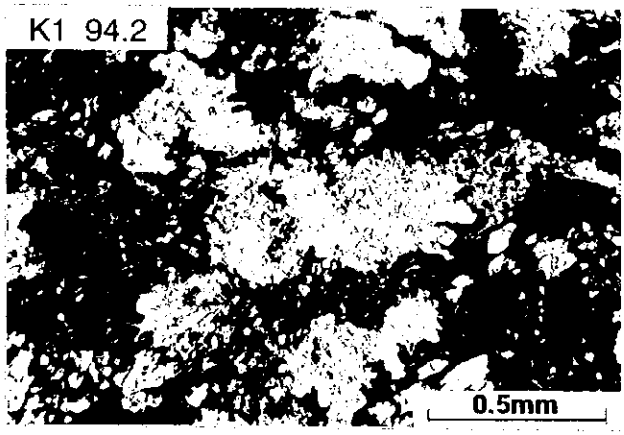
Plane polarized light

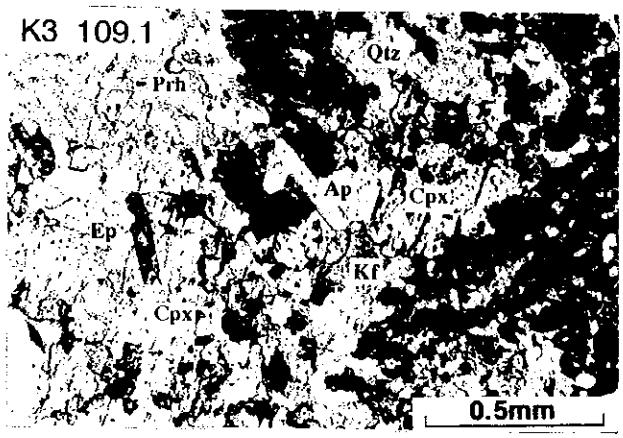


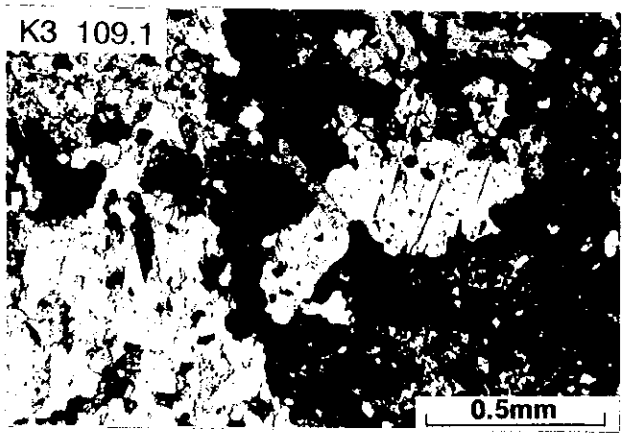
Crossed polarized light

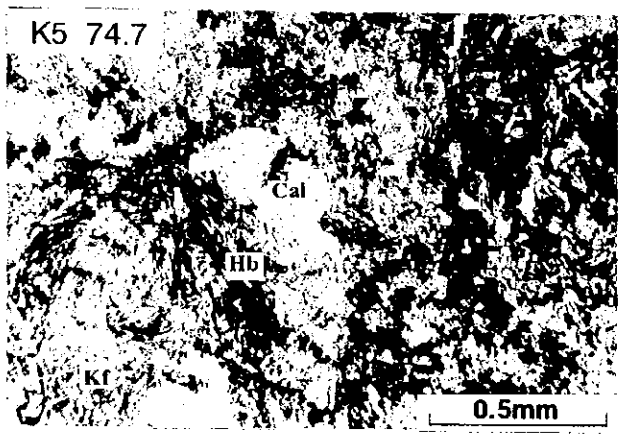


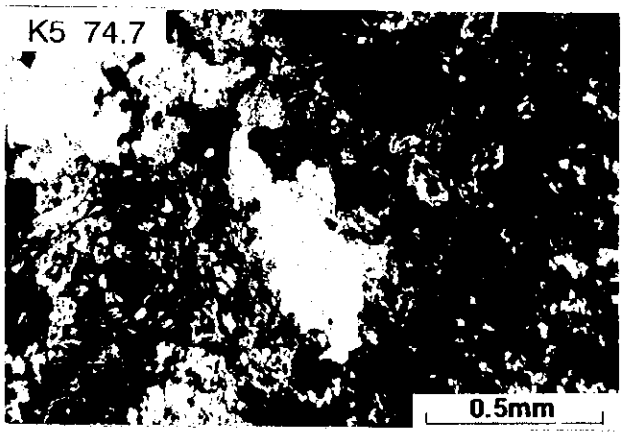






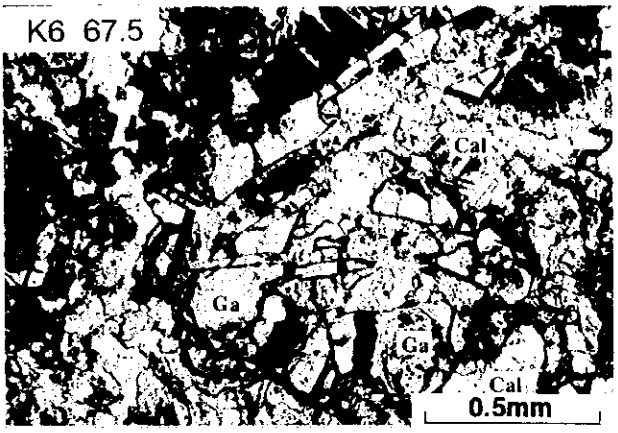




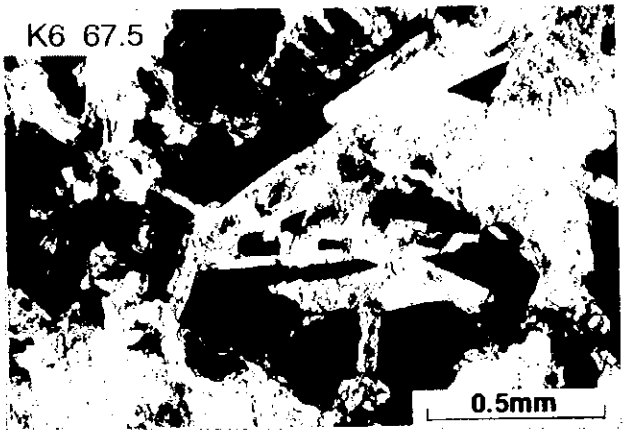


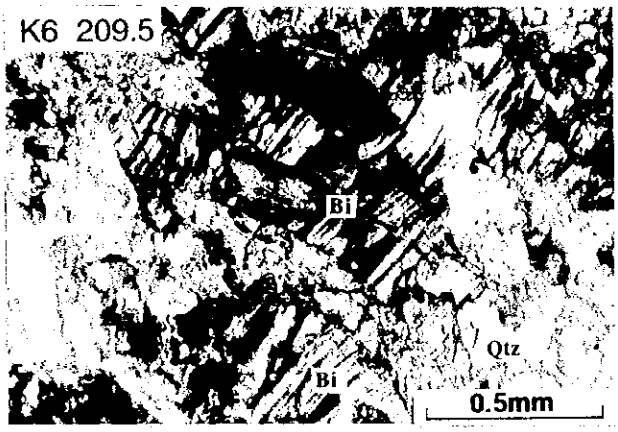
Appendix 2 (2) Photomicrographs of the Thin Sections

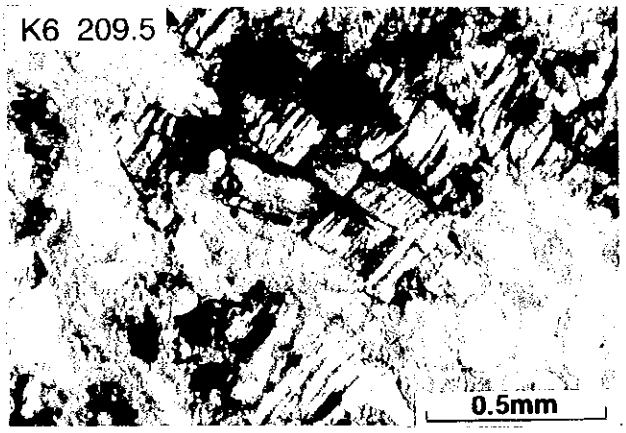
Plane polarized light

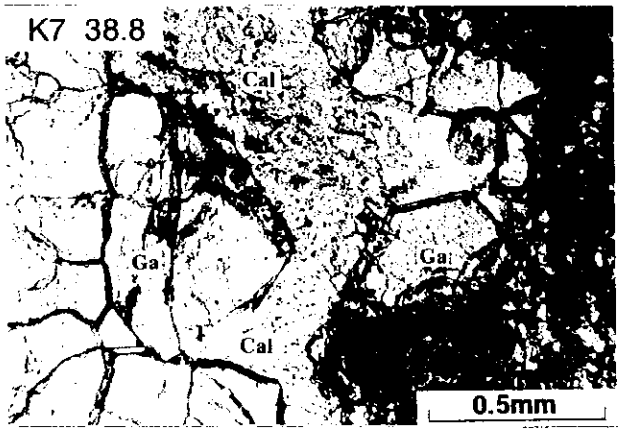


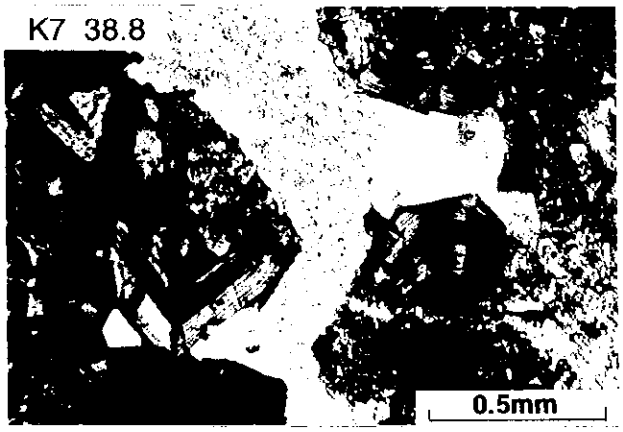
Crossed polarized light

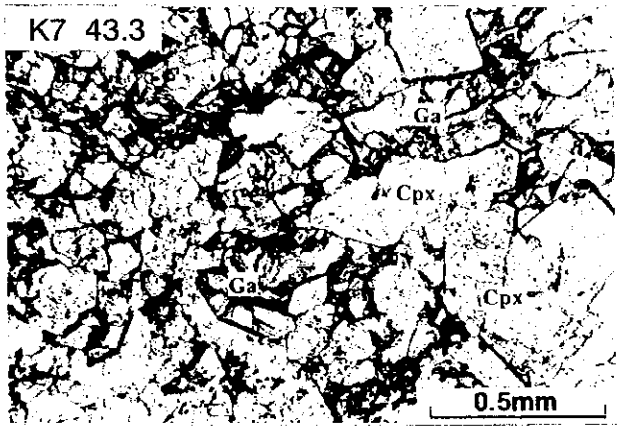


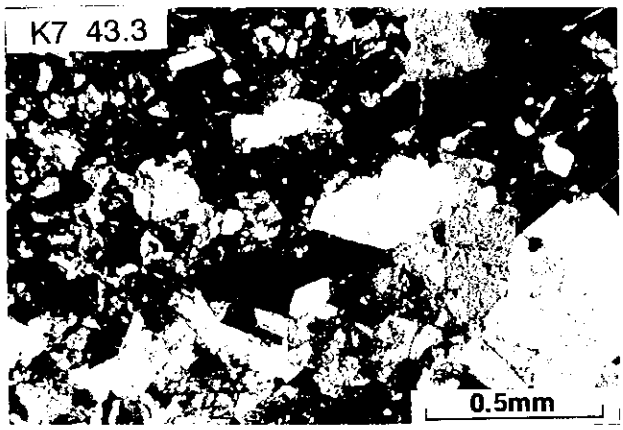






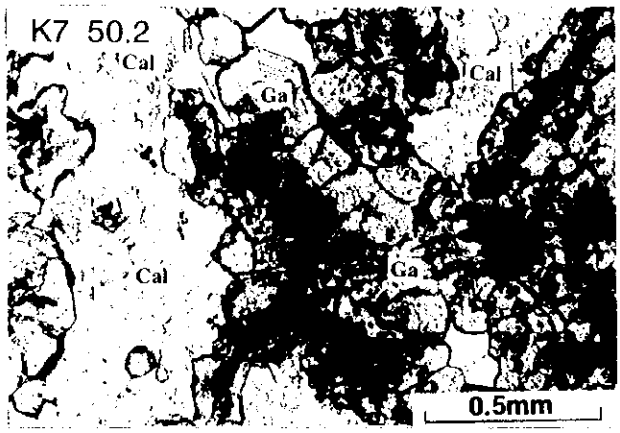




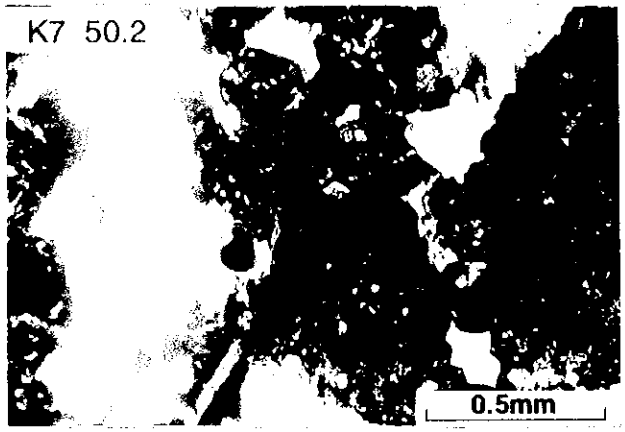


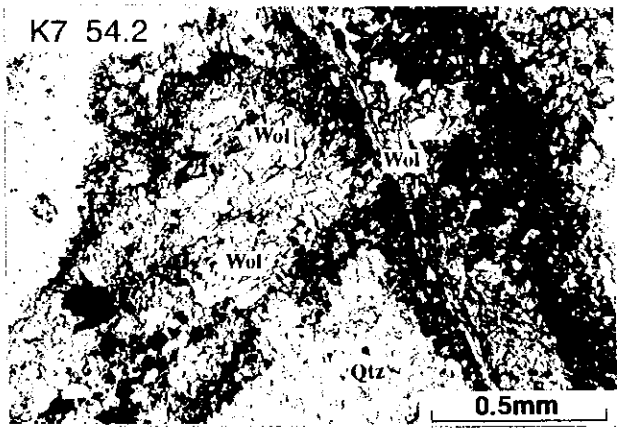
Appendix 2 (3) Photomicrographs of the Thin Sections

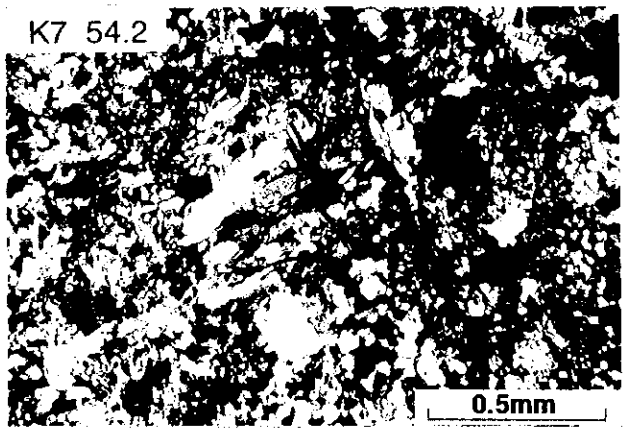
Plane polarized light

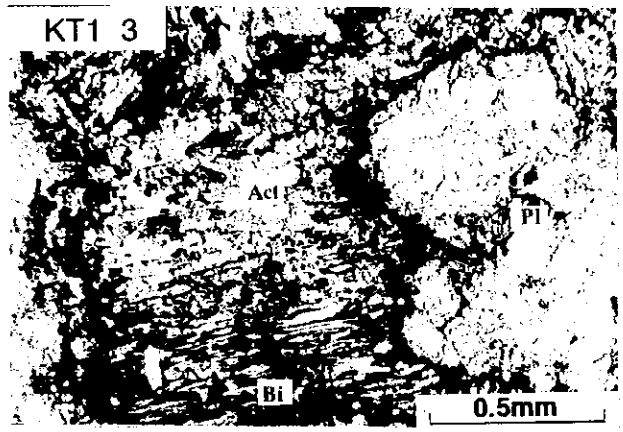


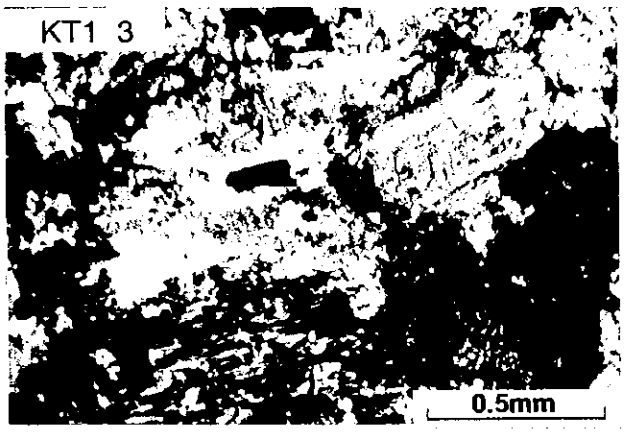
Crossed polarized light

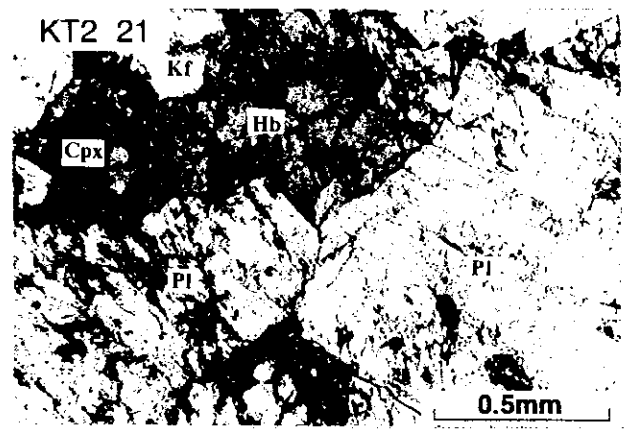


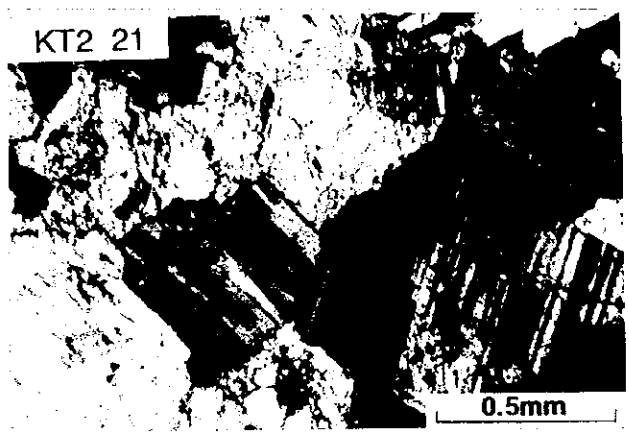






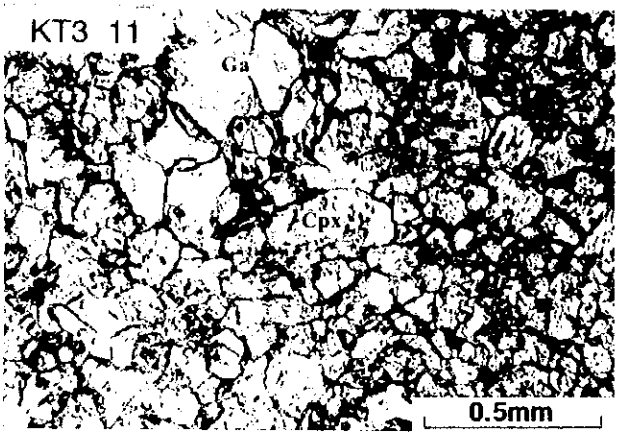




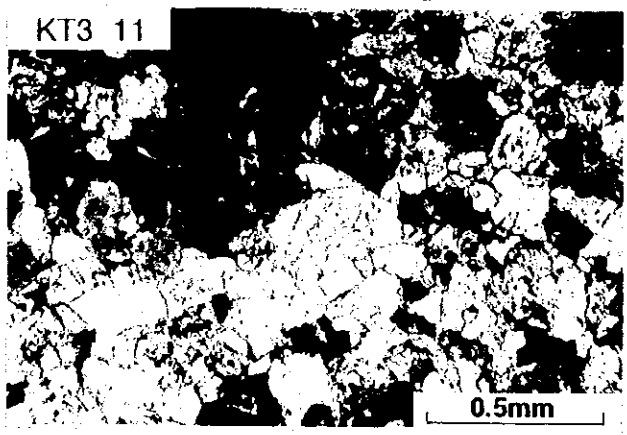


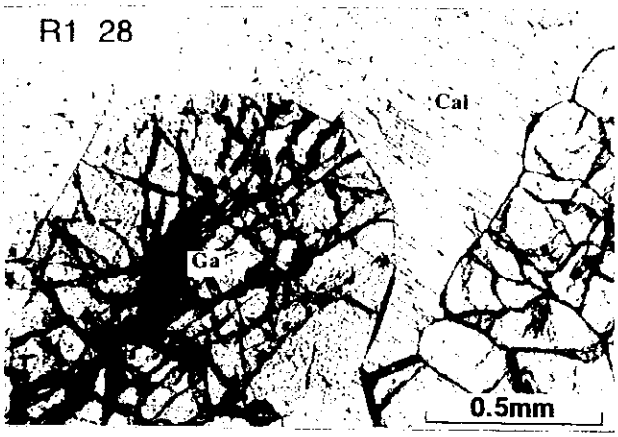
Appendix 2 (4) Photomicrographs of the Thin Sections

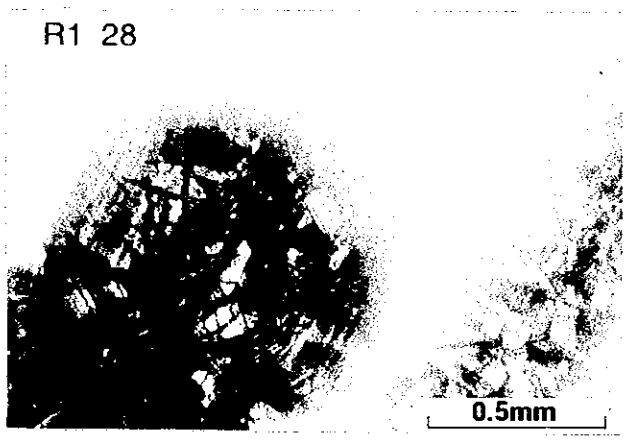
Plane polarized light

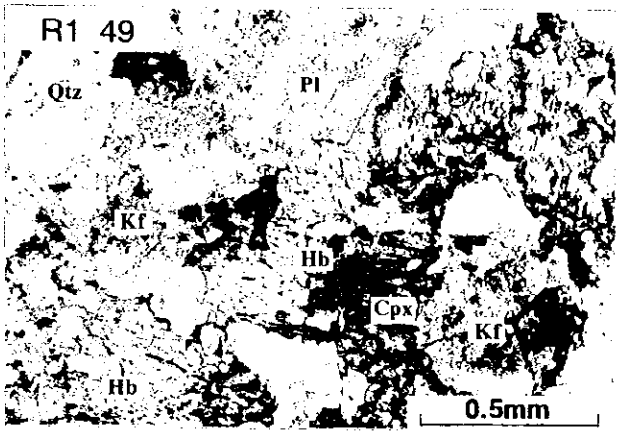


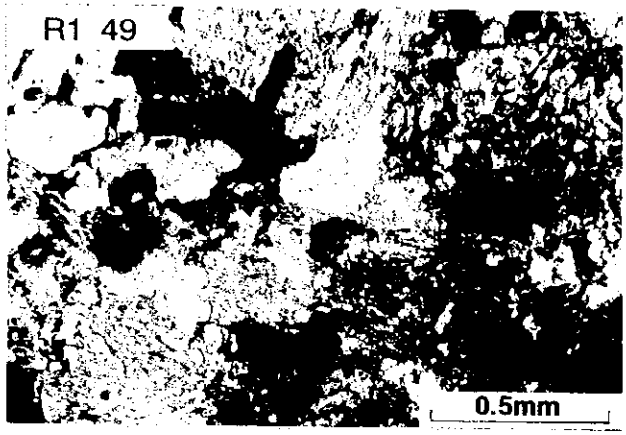
Crossed polarized light

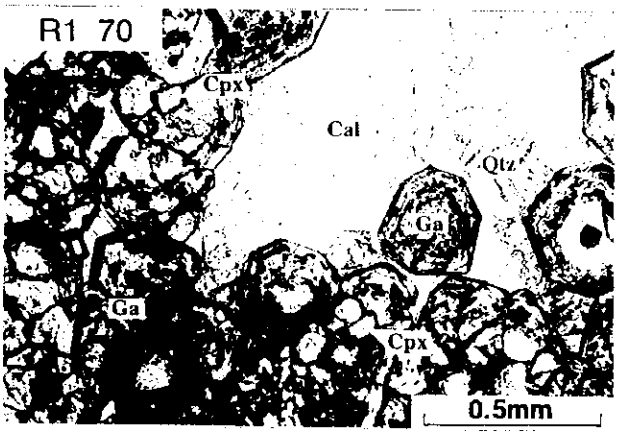


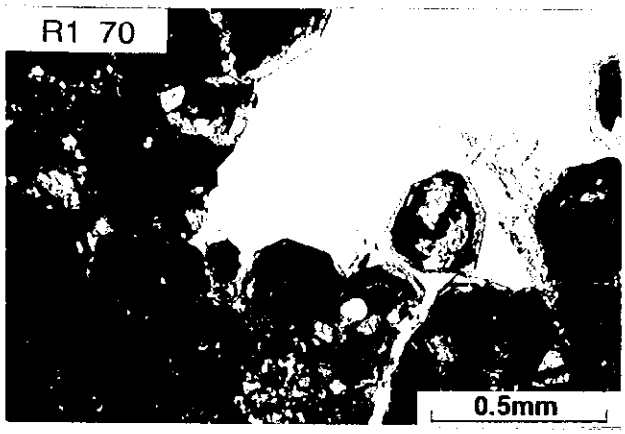






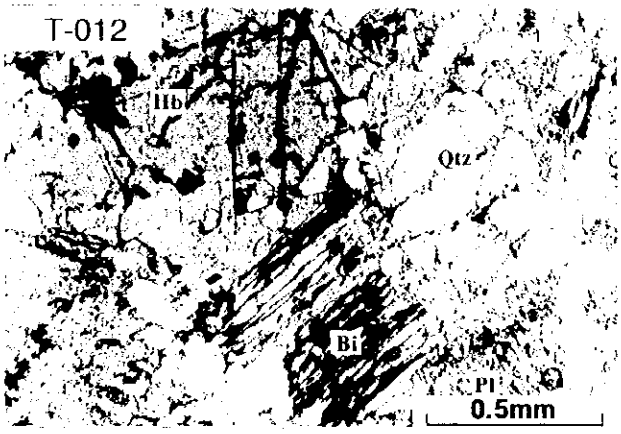




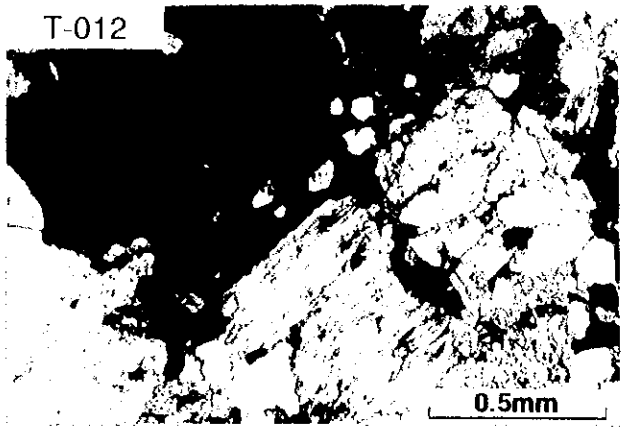


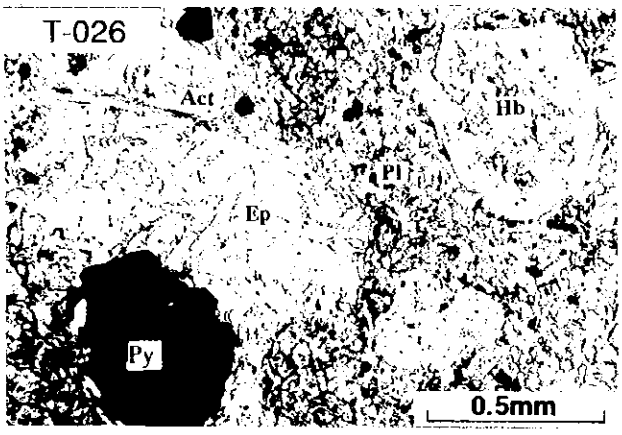
Appendix 2 (5) Photomicrographs of the Thin Sections

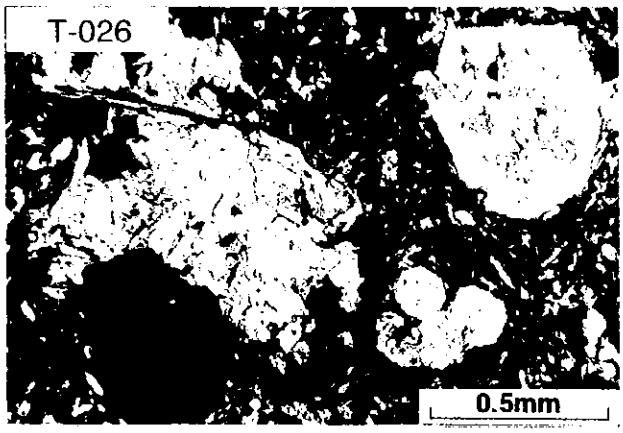
Plane polarized light

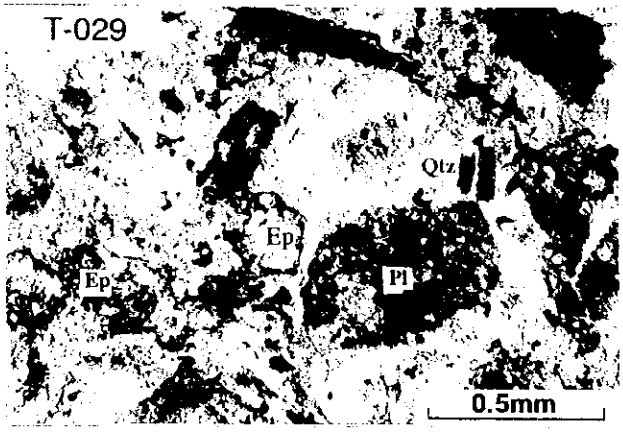


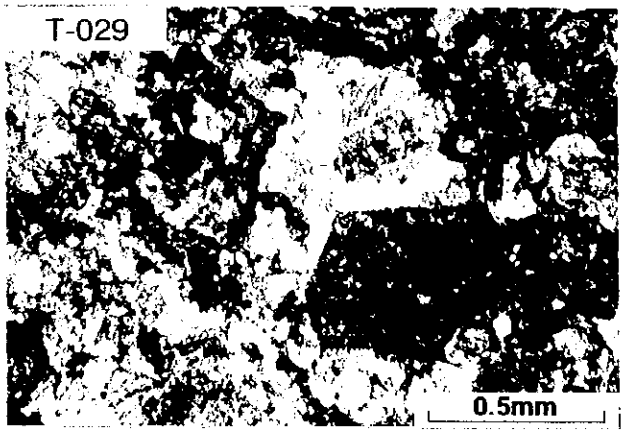
Crossed polarized light

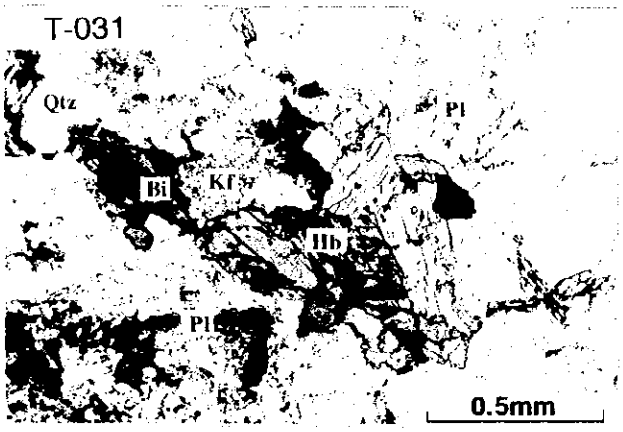


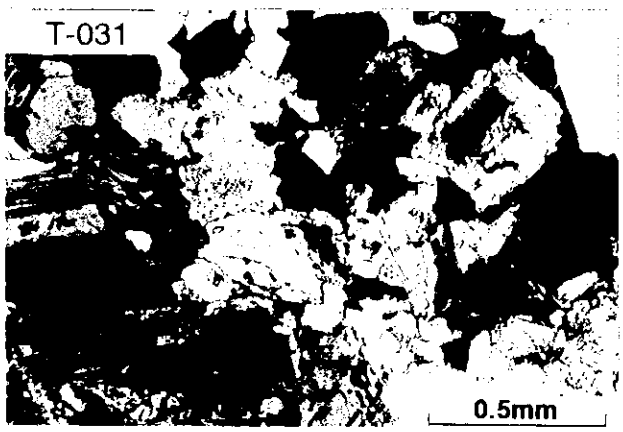






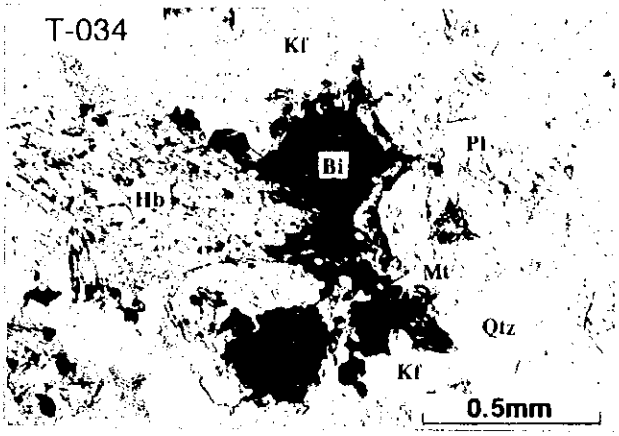




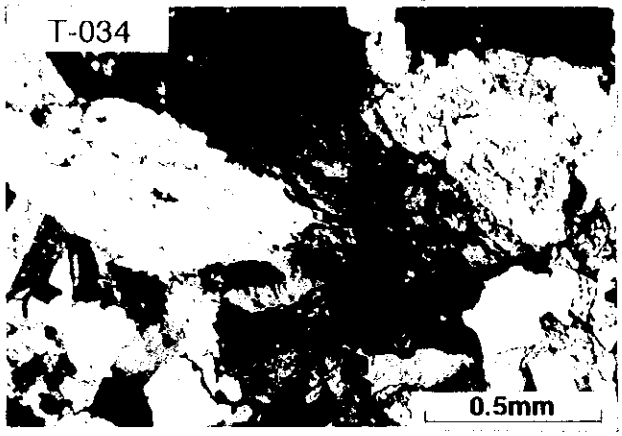


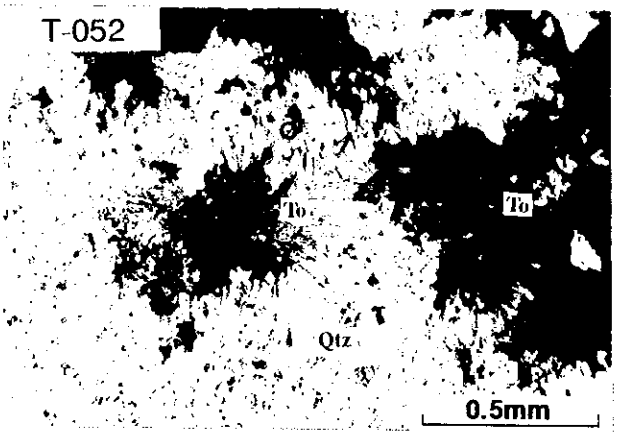
Appendix 2 (6) Photomicrographs of the Thin Sections

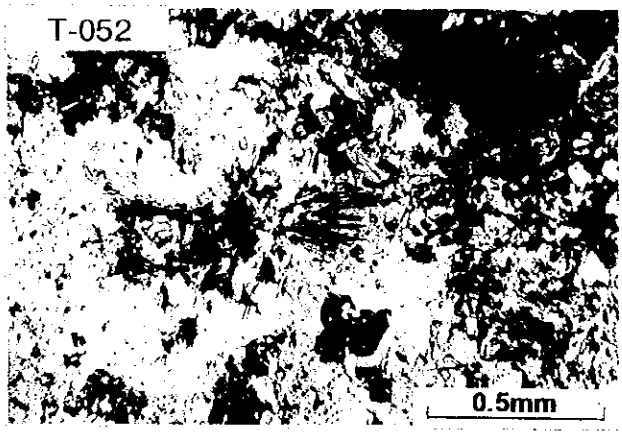
Plane polarized light

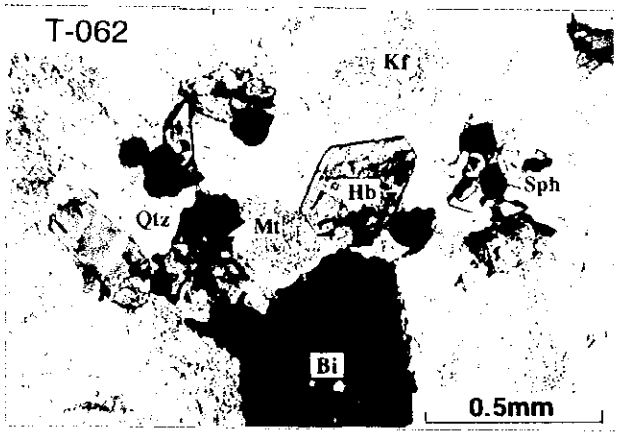


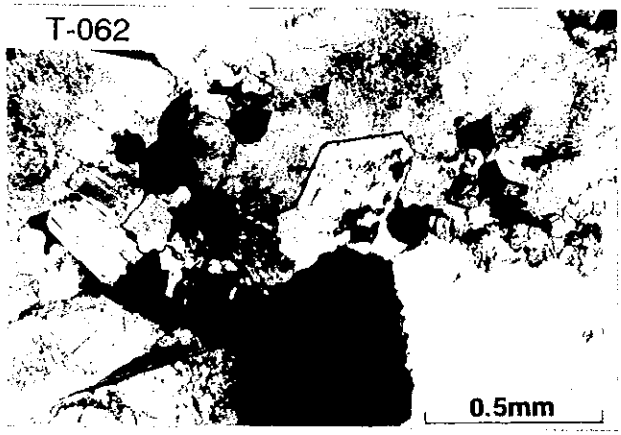
Crossed polarized light

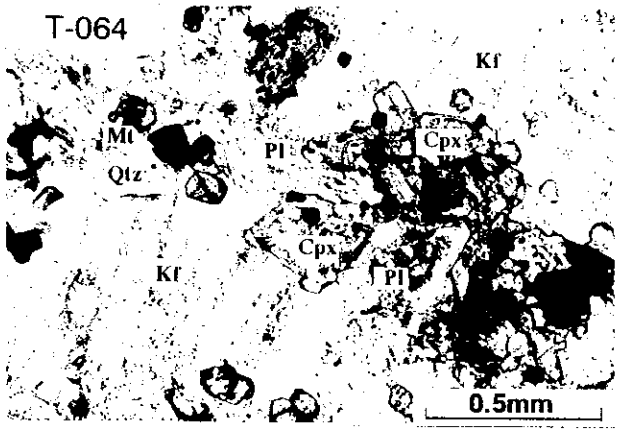


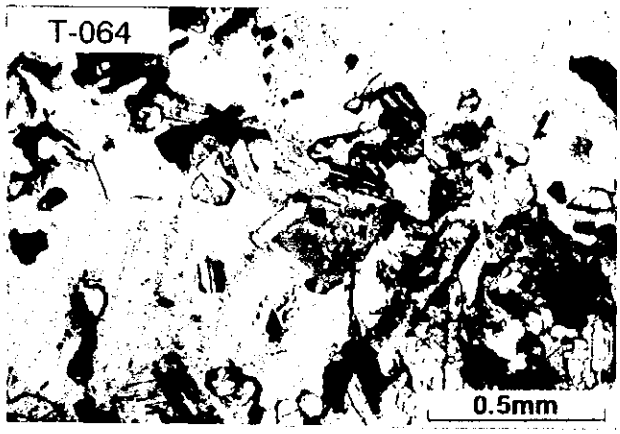






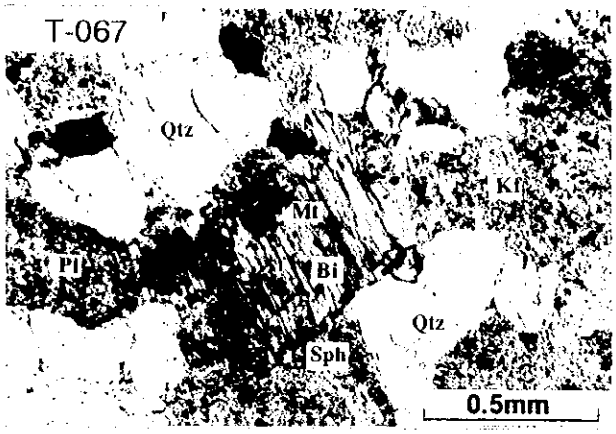




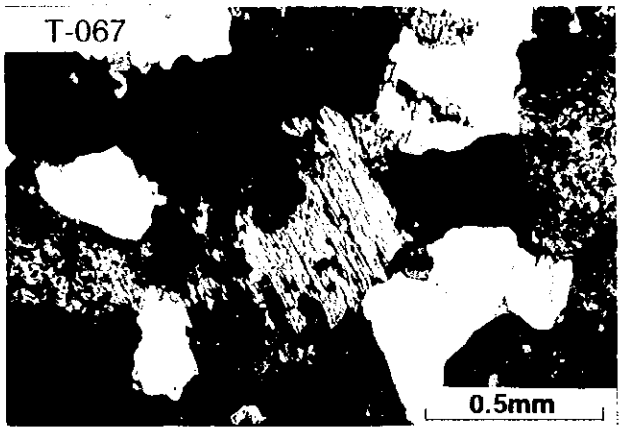


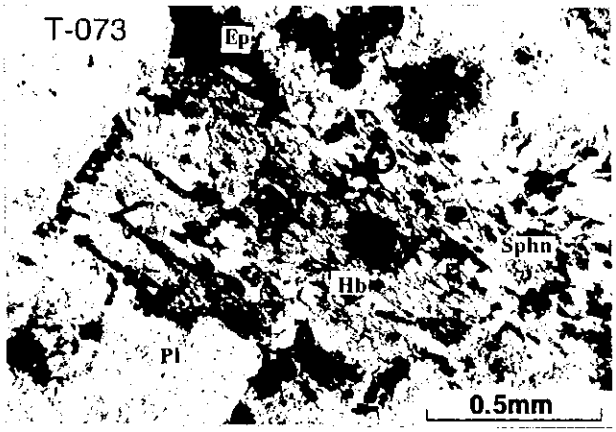
Appendix 2 (7) Photomicrographs of the Thin Sections

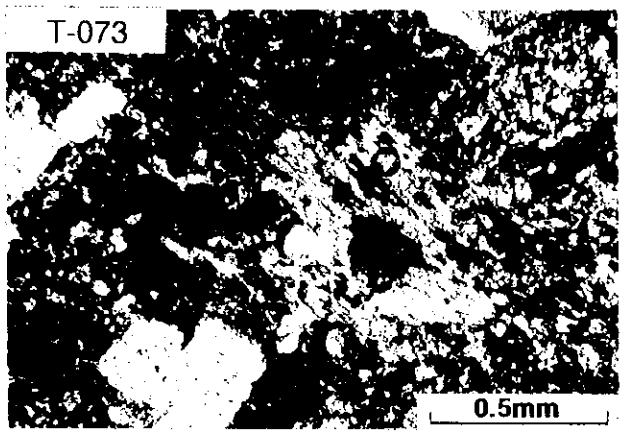
Plane polarized light

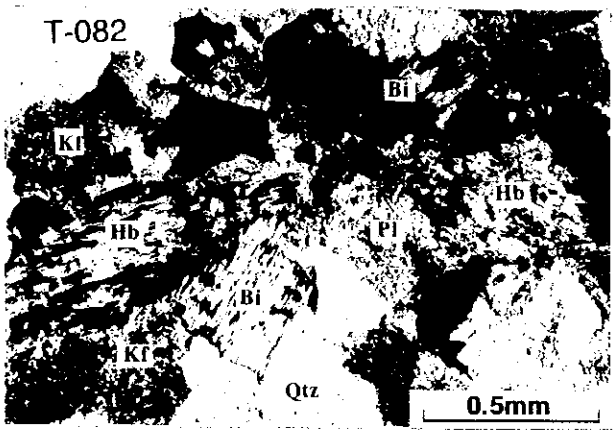


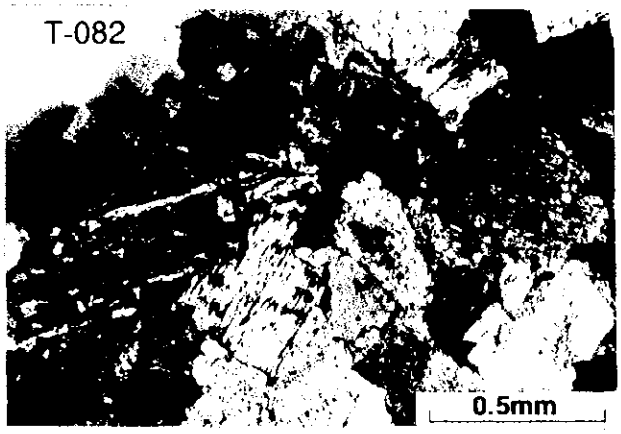
Crossed polarized light

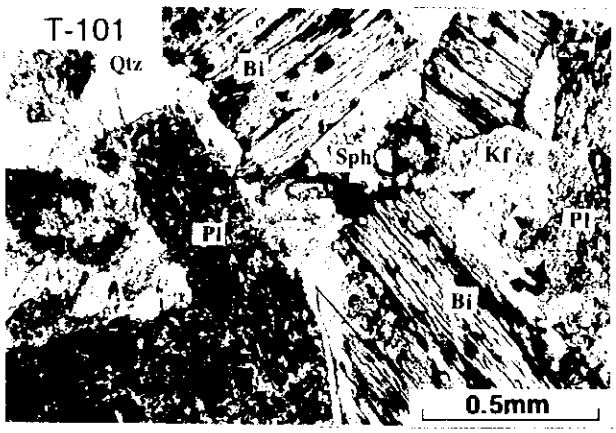


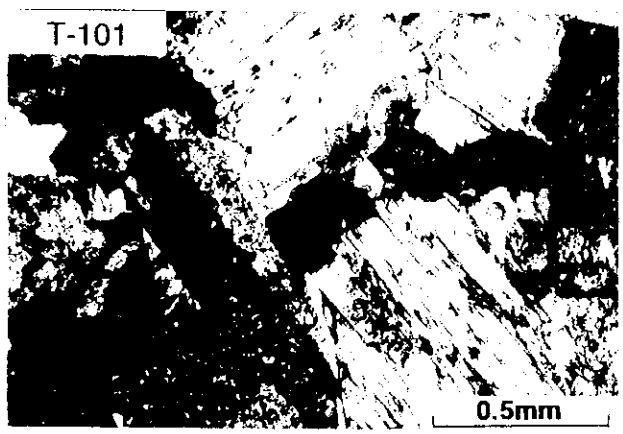






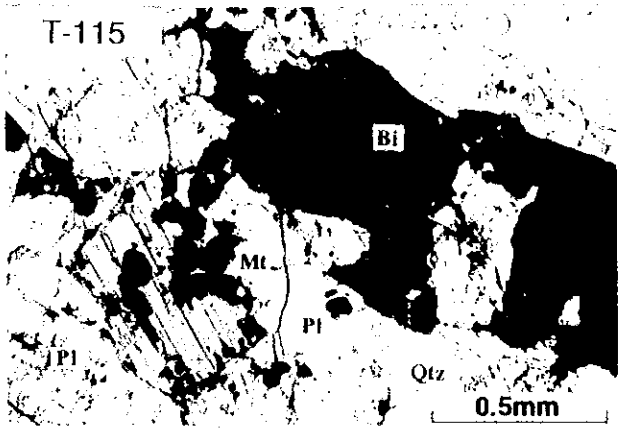




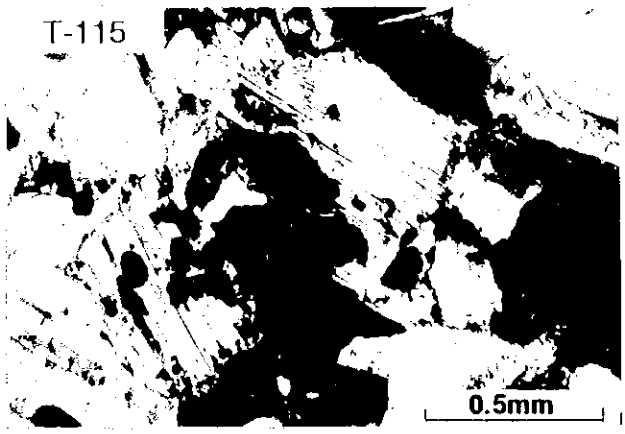


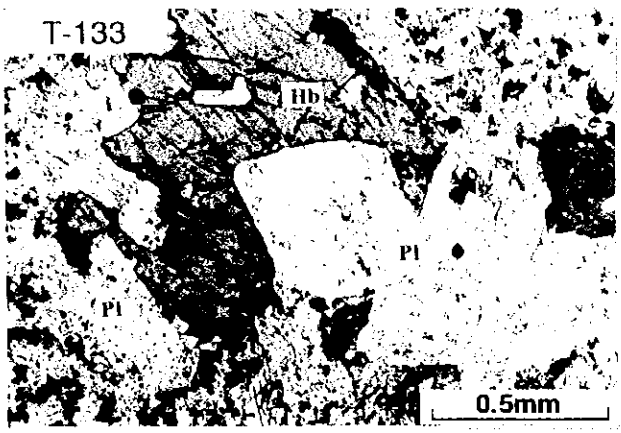
Appendix 2 (8) Photomicrographs of the Thin Sections

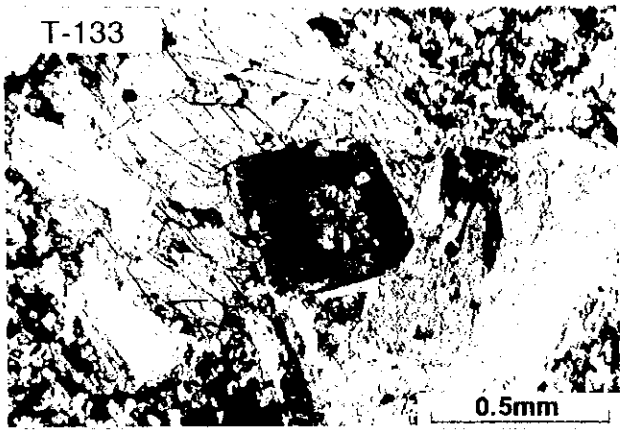
Plane polarized light



Crossed polarized light







No.	Sample No.	Locality		Sample Name	Ore minerals													Gangue minerals										Remarks
		District or Drill Hole	Place or Depth		Cp	Bn	El	Bi	Cv	Cc	Py	Mar	Mal	Cry	Az	Hm	Gt	Qz	Pl	Kf	Ga	Cpx	Ep	Cal	Wol	Prh	Chl	Ser	
1	K 3 29.1	MJKK-3	29.1m	Epidote-Ga skarn with SCM							·		·	△		·	△	△			◎		△	○					Ga : strongly anisotropic
2	K 3 34.2	MJKK-3	34.2m	Cpx-Ga skarn										△			△	△			◎	△		△					With Qz-Cal vein. Ga : weakly zoned.
3	K 3 55.2	MJKK-3	55.2m	Cpx-Ga skarn										·			△	△			◎	△		△					With Qz-Cal vein. Ga : strongly zoned along vein
4	K 3 66.0	MJKK-3	66.0m	Cpx-Ga skarn													·				◎	○		△					With Qz-Cal vein. Ga : strongly zoned along vein
5	K 3 86.7	MJKK-3	86.7m	Epidotte-Ga skarn													·				◎		·	○					With Cal vein
6	K 5 25.9	MJKK-5	25.9m	Wol-cpx-Ga skarn with SCM		·			·	·				△			·				○	○		○	△				Endoskarn from granodioriorite. Ga : strongly anisotropic
7	K 5 35.9	MJKK-5	35.9m	Cal-quartz vein with SCM	·									○			△	○						△					
8	K 6 55.4	MJKK-6	55.4m	Cpx-Ga skarn														△			○	○		○		△			Consisting of Ga-rich and Cpx-rich bands. Ga: Isotropic
9	K 7 34.7	MJKK-7	34.7m	Ga skarn with Py-Cal quartz vein	·													○			○			○		△			Ga : isotropic, highly fractured
10	K 7 37.6	MJKK-7	37.6m	Ga skarn with hematite quartz vein							·					△	·	○			◎	△		○		△			Ga : anisotropic
11	KT 1 14	Kichi-Sandyk	Trench- I	Cpx-Ga skarn with SCM	·								△	△		△	△	○			○	·		○					Ga : fractured, strongly anisotropic
12	KT 2 10	Kichi-Sandyk	Trench- II	Cp-rich Cpx-Ga skarn with SCM	△	·							△	△		△					◎	△		△					Ga : strongly anisotropic
13	KT 3 2	Kichi-Sandyk	Trench-III	Cp-Bn-rich Cpx-Ga skarn with SCM	△	△		·	·	·			△	△							○	○		△					Including Ag-mineral(?) and native bismuth in Bn
14	R 1 17	Kichi-Sandyk	Road R-1	Ga skarn with SCM						·			·	△			△				○			○					Ga : anisotropic
15	R 1 56	Kichi-Sandyk	Road R-1	Py-rich skarnized granodiorite							△						△	○	○	○		○						·	Pl : replaced by cpx
16	T - 002	Turpac-Tushty	Ak-Kamou	Hematite quartz vein												△	△	◎											Hm-Gt : showing colloform texture
17	T - 018	Turpac-Tushty	Bismutovoe	Hematite-Ga skarn												△		○			○		△	○					Ga : strongly anisotropic
18	T - 021	Turpac-Tushty	Bismutovoe	Hematite-Ga skarn with SCM									△			△	○	△			◎								Ga : fractured, injected by Qz veinlets
19	T - 023	Turpac-Tushty	Bismutovoe	Silicified crystalline limestone												△	△	○						◎					
20	T - 032	Turpac-Tushty	Jety-Zindan NW	Py-rich Ga skarn					·		△							○			◎			○					Ga : anisotropic
21	T - 040	Turpac-Tushty	Jety-Zindan W	Ga skarn with SCM									△				·	△			◎		·	◎			·		Ga : zoned from yellow isotropic core to colorless anisotropic rim
22	T - 042	Turpac-Tushty	Kok-Kaiky	Py quartz vein with SCM	·				·	·	△		△	·	·	△	△	◎											
23	T - 043	Turpac-Tushty	Kok-Kaiky	Py quartz vein with SCM	·					·	△		·	△		△	△	◎											
24	T - 044	Turpac-Tushty	Kok-Kaiky	Py quartz vein						·	○					△	○	○											Py : replaced by Qz
25	T - 072	Turpac-Tushty	Kok-Kaiky	Py quartz vein with SCM	·				·	·	△		△			△	△	◎											Cp : rimmed with Cy, Cc
26	T - 099	Turpac-Tushty	T-Tushty skarn	Py quartz vein with SCM	·						△		○	△		△	○	◎										△	Including Mn-oxide(?) mineral
27	T - 104	Turpac-Tushty	T-T cre. D-str.	Cp-rich Cpx-Ga skarn with SCM	△										△		△	·			◎	○		△					Ga : slightly anisotropic
28	T - 105	Turpac-Tushty	T-Tushty(NE)	Hematite quartz vein with SCM	·				·	·	·		△	△		△	○	◎											Cp, Py : rimmed with Cv, Cc
29	T - 127	Turpac-Tushty	T-Tushty(central)	Hematite quartz vein												△	·	◎											Hm : acicular-radial or pseudomorph after Py
30	T - 129	Turpac-Tushty	T-Tushty (NE)	Hematite quartz vein with SCM	·				·	·			△	△		△	○	◎											

[Abbreviations] cre. : creek, str. : streem

Act : actinolite, Az : azurite, Bi : native bismuth, Bn : bornite, Cal : calcite, Cc : chalcocite, Chl : chlorite, Cry : chrysocolla, Cp : chalcopyrite, Cpx : clinopyroxene, Cv : covelline, El : electrum, Ep :epidote, Ga : garnet, Gt : goethite, Hm : hematite, Mal : malachite, Pl : plagioclase, Prh : prehnite, Py : pyrite, Qz : quartz, Ser : sericite, SCM : secondary Cu-mineral, Wol : wollastonite

[Legend] ◎ Abundant, ○ Common, △ Poor, · Rare

Appendix 3 Result of Microscopic Observations of Polished Thin Sections

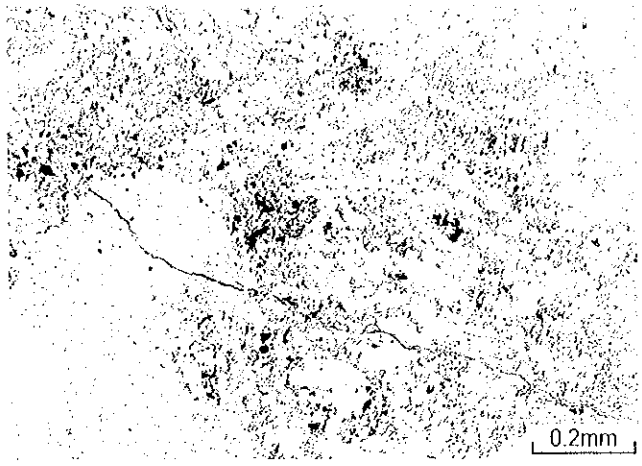
Appendix 4 (1) Photomicrographs of the Polished Thin Sections

K3 29.1

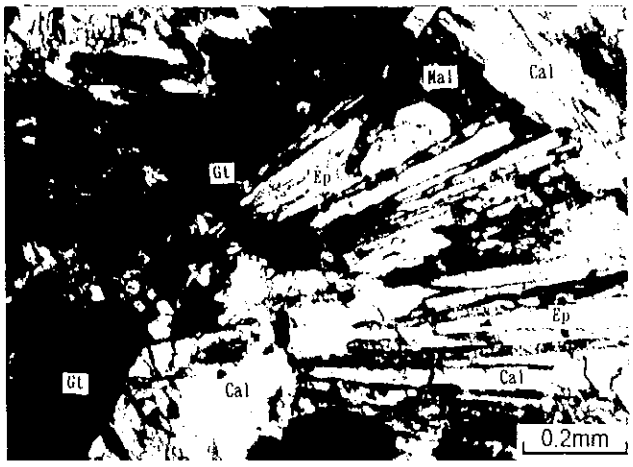
reflected light

K3 34.2

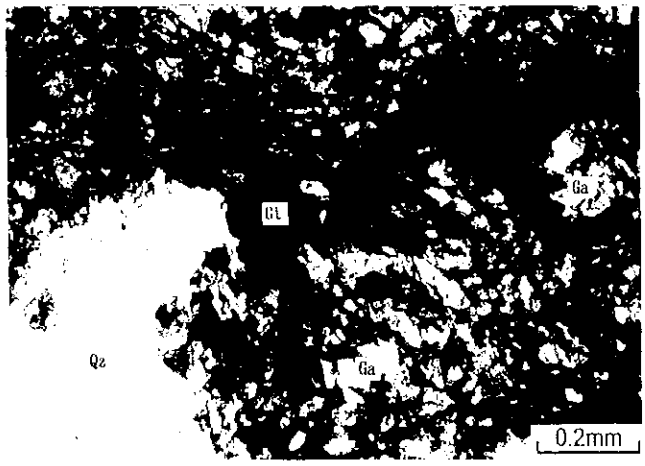
reflected light



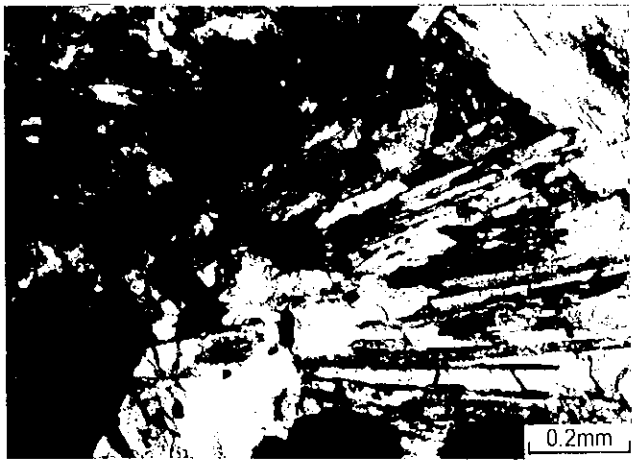
transmitted light(plane)



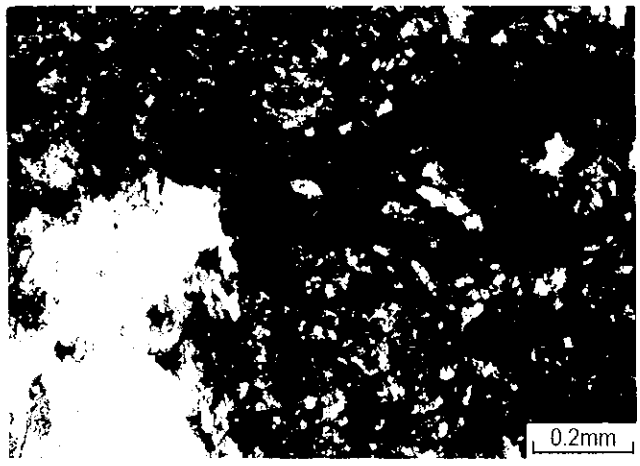
transmitted light(plane)



transmitted light (crossed)



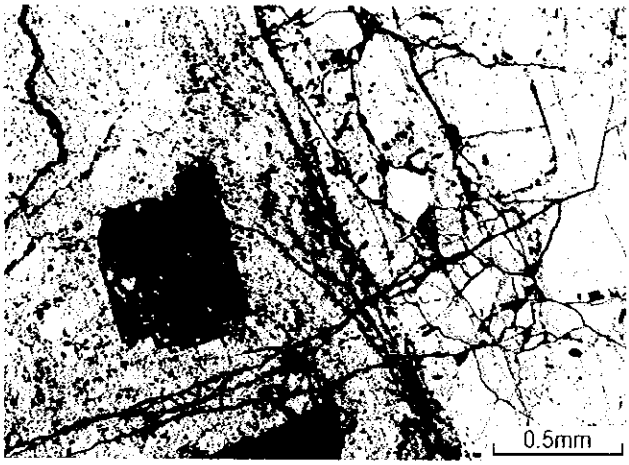
transmitted light (crossed)



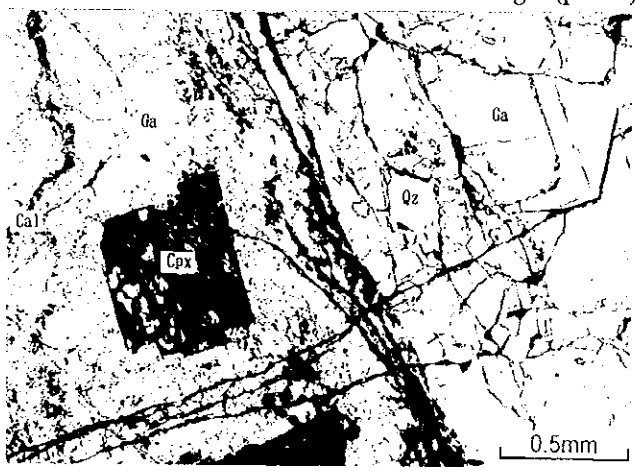
Appendix 4 (2) Photomicrographs of the Polished Thin Sections

K3 55.2

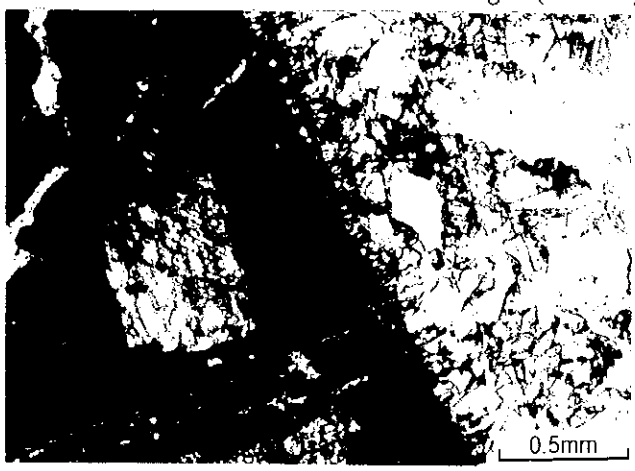
reflected light



transmitted light(plane)

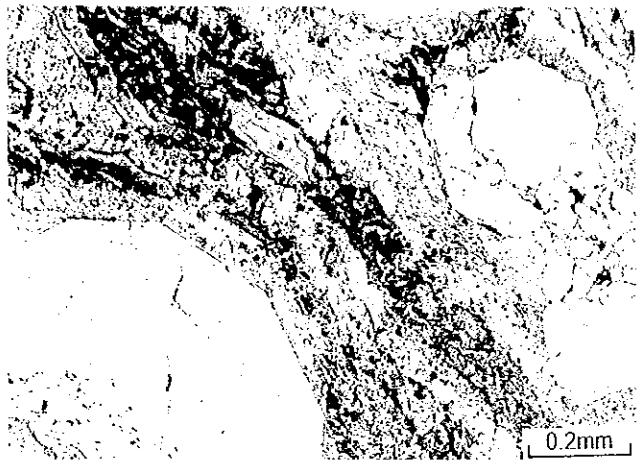


transmitted light (crossed)

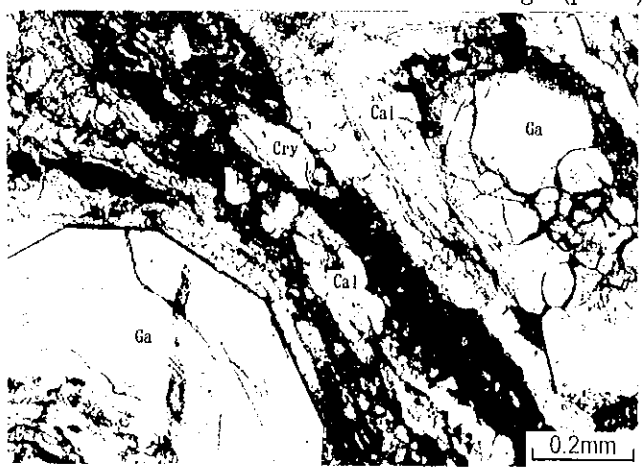


K3 66.0

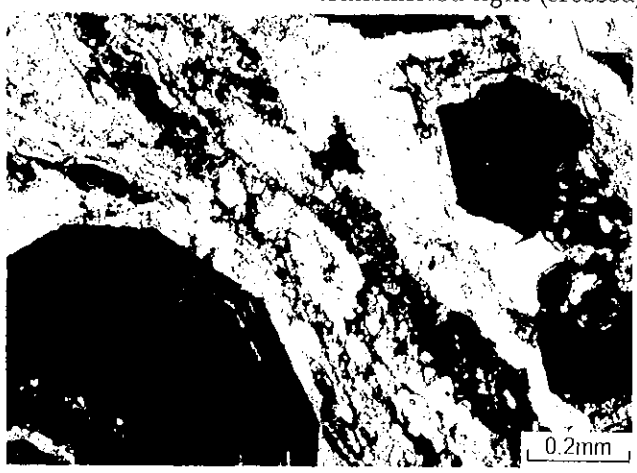
reflected light



transmitted light(plane)



transmitted light (crossed)

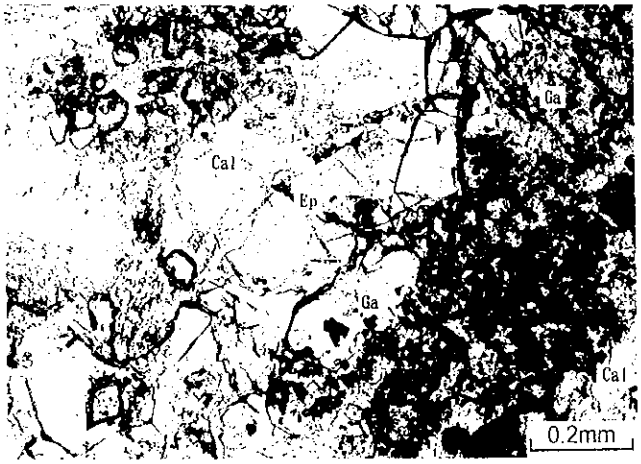


Appendix 4 (3) Photomicrographs of the Polished Thin Sections

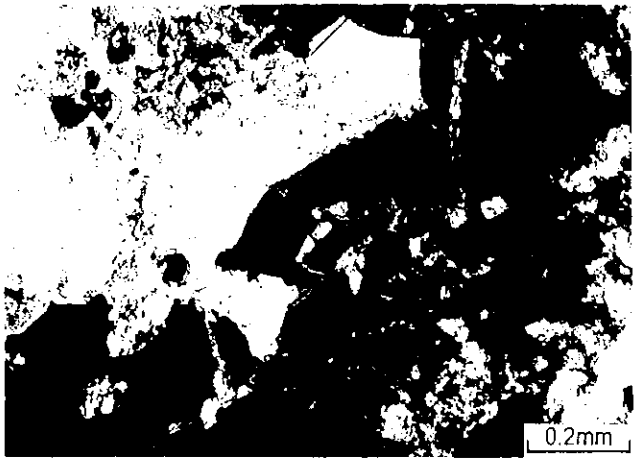
K3 86.7

reflected light

transmitted light(plane)

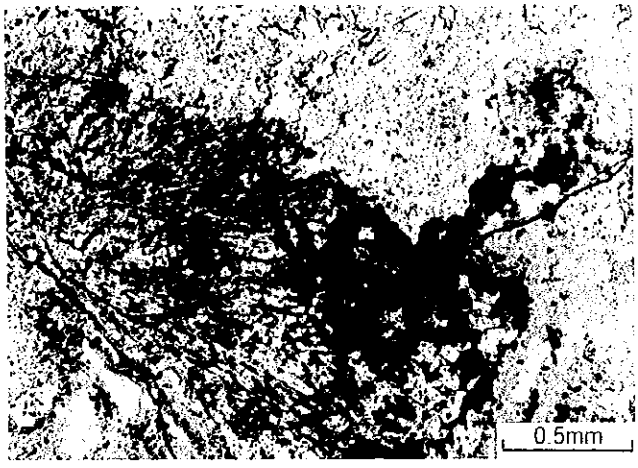


transmitted light (crossed)

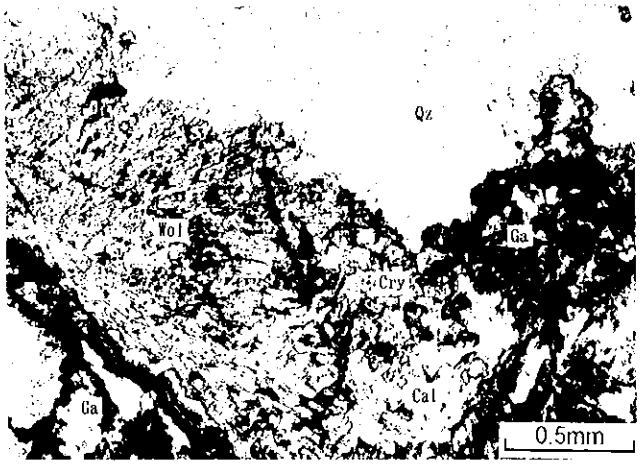


K5 25.9

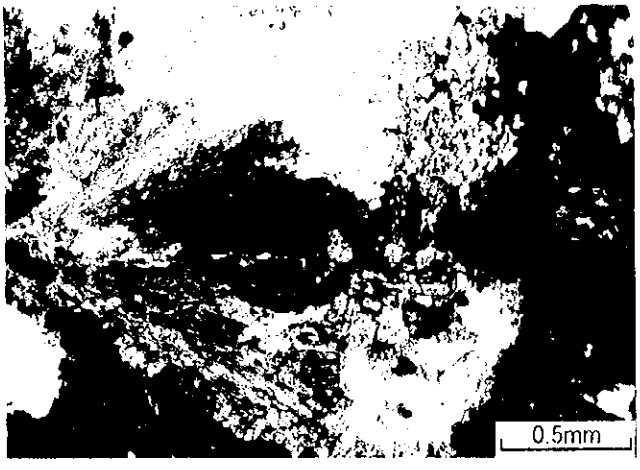
reflected light



transmitted light(plane)



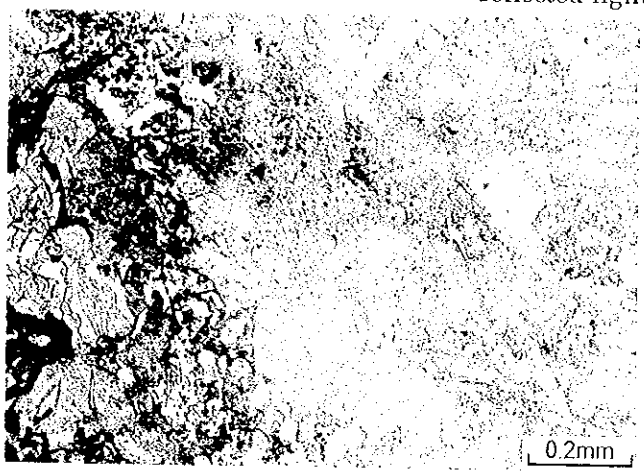
transmitted light (crossed)



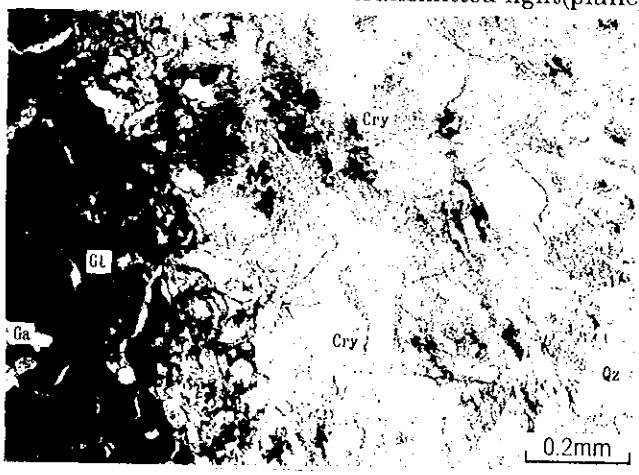
Appendix 4 (4) Photomicrographs of the Polished Thin Sections

K5 35.9

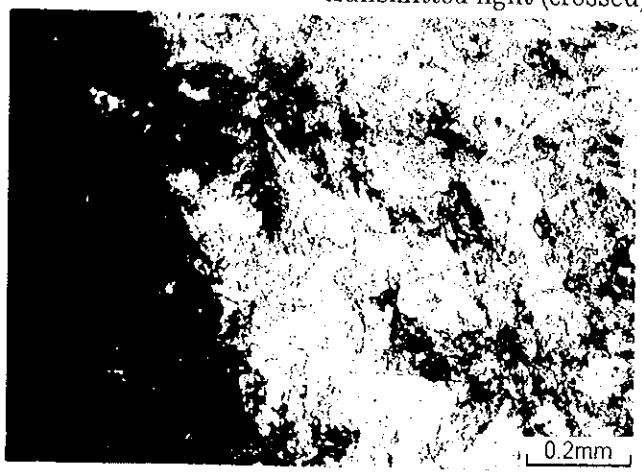
reflected light



transmitted light(plane)

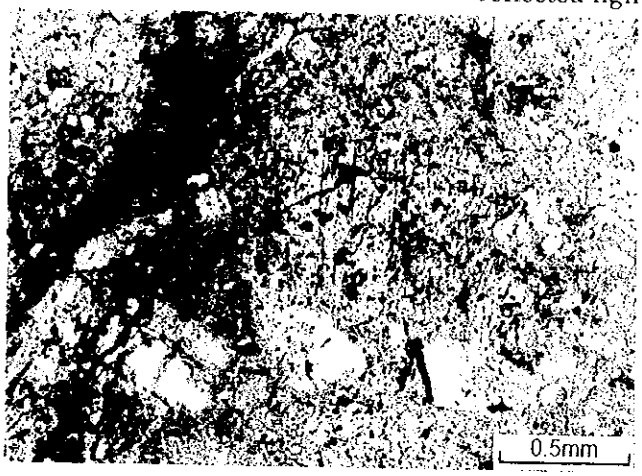


transmitted light (crossed)

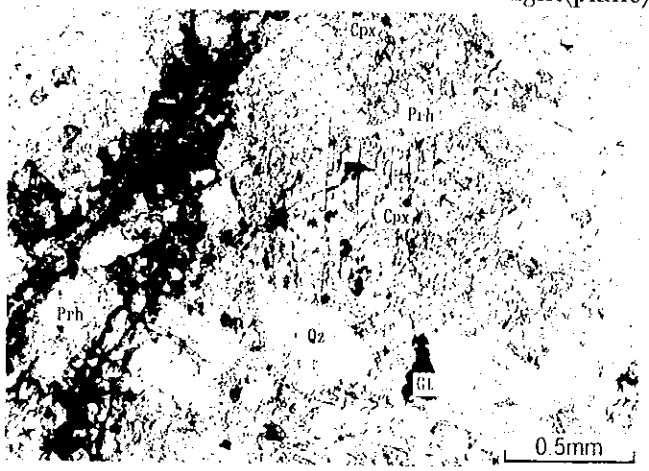


K6 55.4

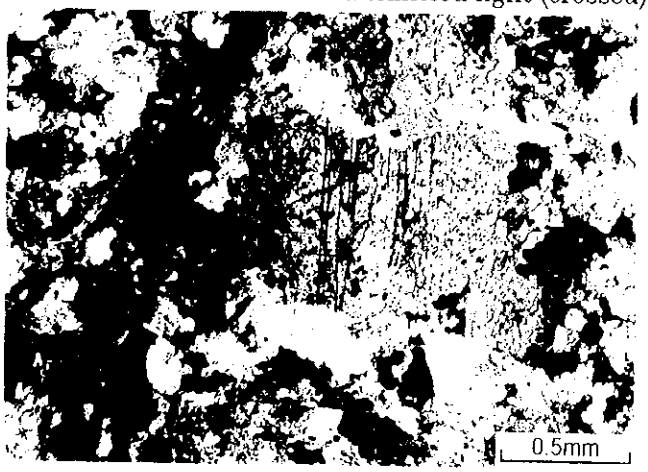
reflected light



transmitted light(plane)



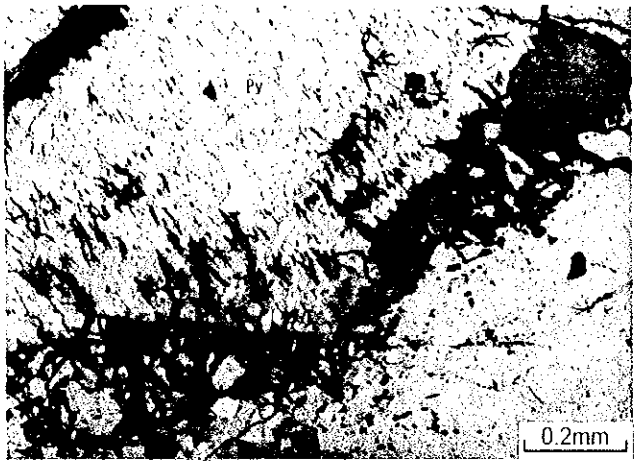
transmitted light (crossed)



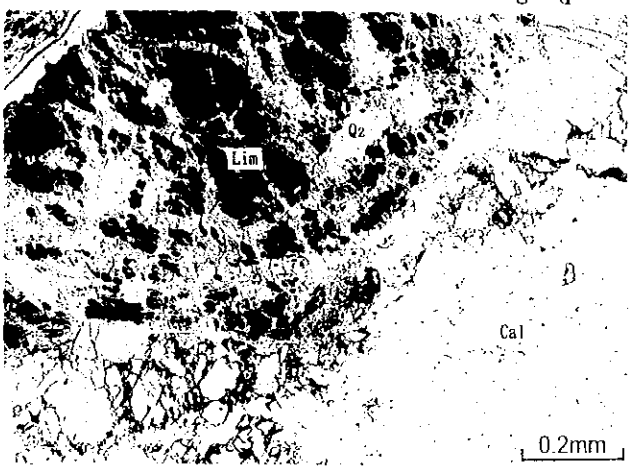
Appendix 4 (5) Photomicrographs of the Polished Thin Sections

K7 34.7

reflected light



transmitted light(plane)



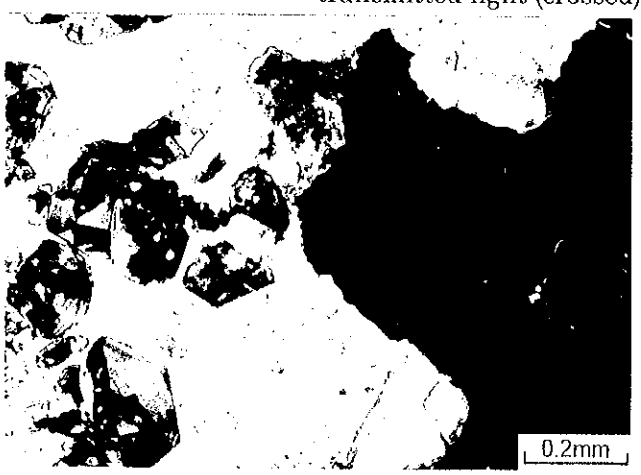
transmitted light (crossed)

K7 37.6

reflected light

transmitted light(plane)

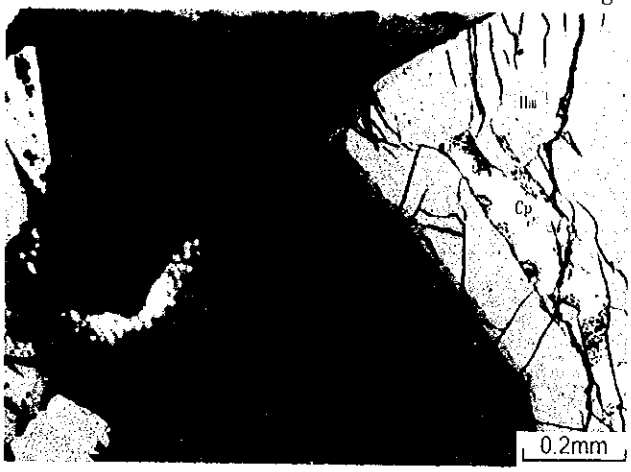
transmitted light (crossed)



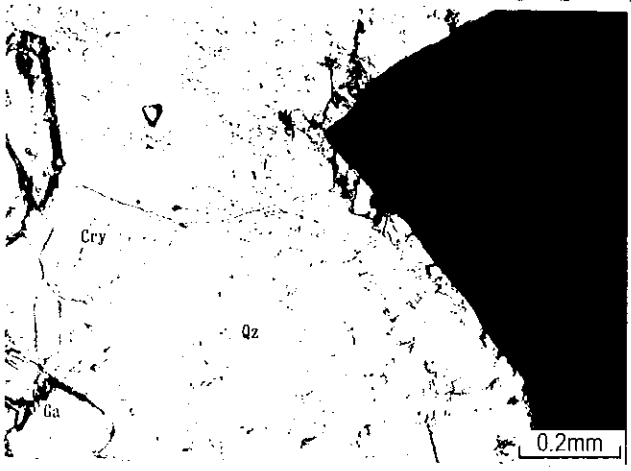
Appendix 4 (6) Photomicrographs of the Polished Thin Sections

KT1 14

reflected light



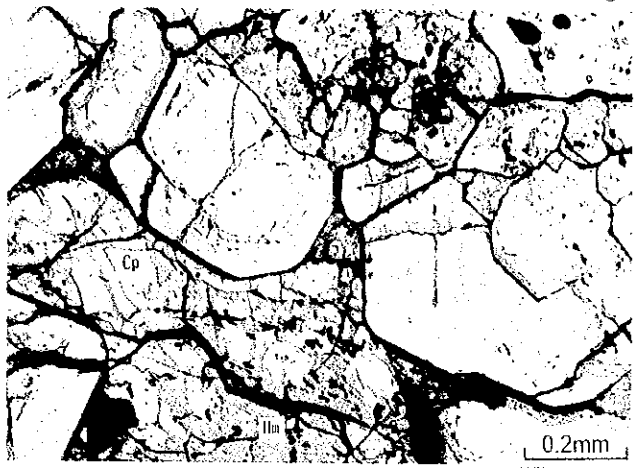
transmitted light(plane)



transmitted light (crossed)

KT2 10

reflected light



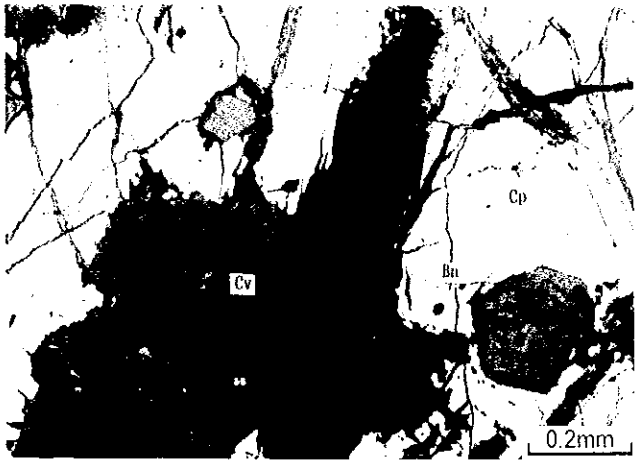
transmitted light(plane)

transmitted light (crossed)

Appendix 4 (7) Photomicrographs of the Polished Thin Sections

KT3 2

reflected light

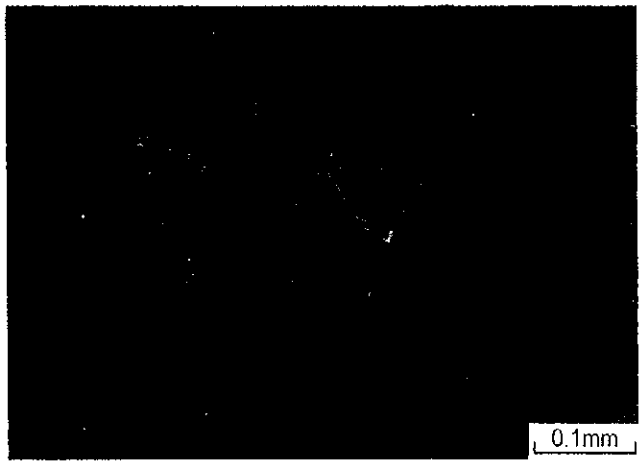


transmitted light(plane)

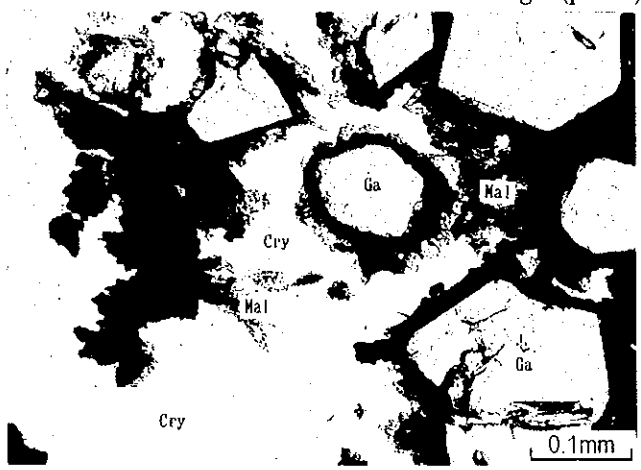
transmitted light (crossed)

R1 17

reflected light



transmitted light(plane)



transmitted light (crossed)