

II MICROSCOPIC PHOTOGRAPHS

Index

Gn;	Galena	PbS
Sp;	Sphalerite	ZnS
Py;	Pyrite	FeS ₂
Cp;	Chalcopyrite	CuFeS ₂
Can;	Canfieldite	4Ag ₂ S(Sn,Ge)S ₂
Arg;	Argentite	Ag ₂ S
Cv;	Covellite	CuS
Bn;	Bornite	Cu ₅ FeS ₄
Stan;	Stannite	Cu ₂ S · FeS · SnS ₂
En;	Enargite	Cu ₃ AsS ₄
Col;	Colusite	Cu ₃ (As,Sn,V,Fe,Sb)S ₄
G;	Gangue	

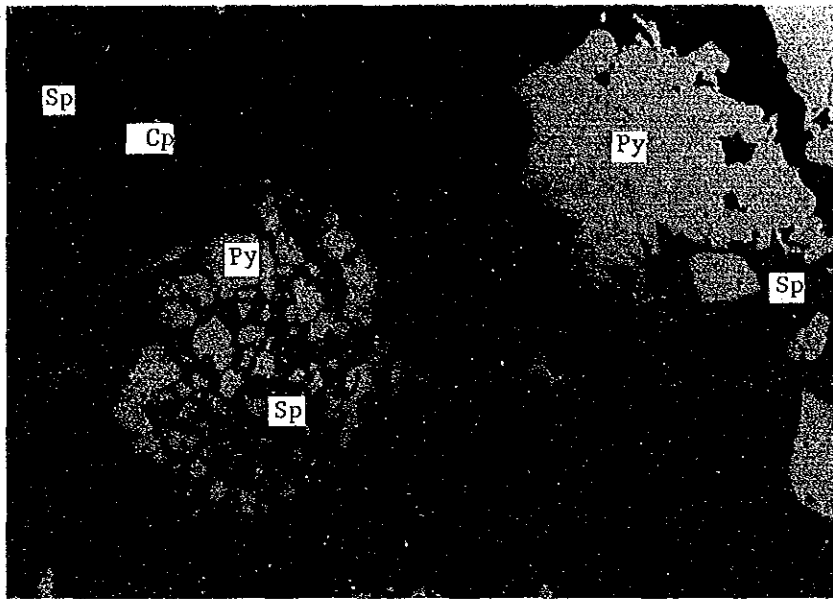
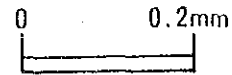


Photo.1 Ore-M



Coexisting sphalerite (Sp) with pyrite (Py).
Sphalerite (Sp) including chalcopyrite (Cp) in the form
of many dots.

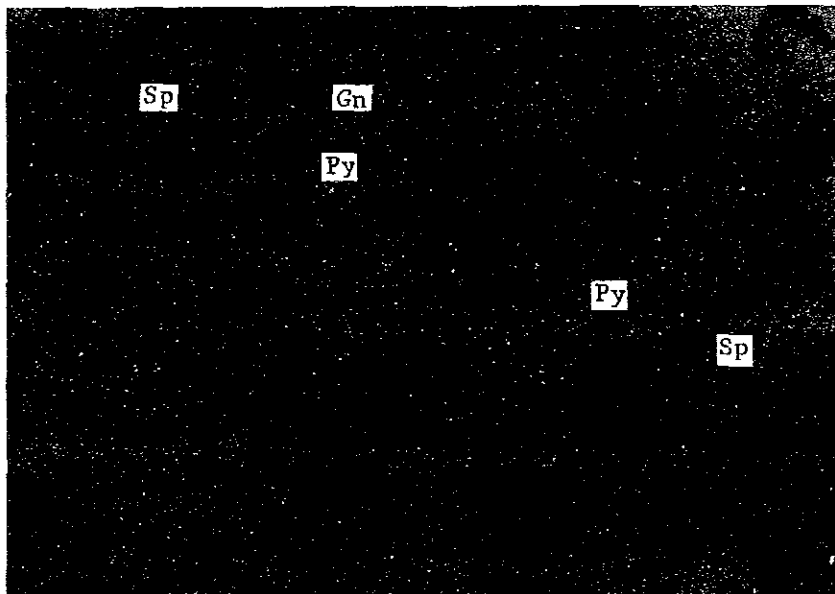
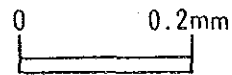


Photo.2 Ore-M



Sphalerite (Sp) and galena (Gn) existing with pyrite (Py).

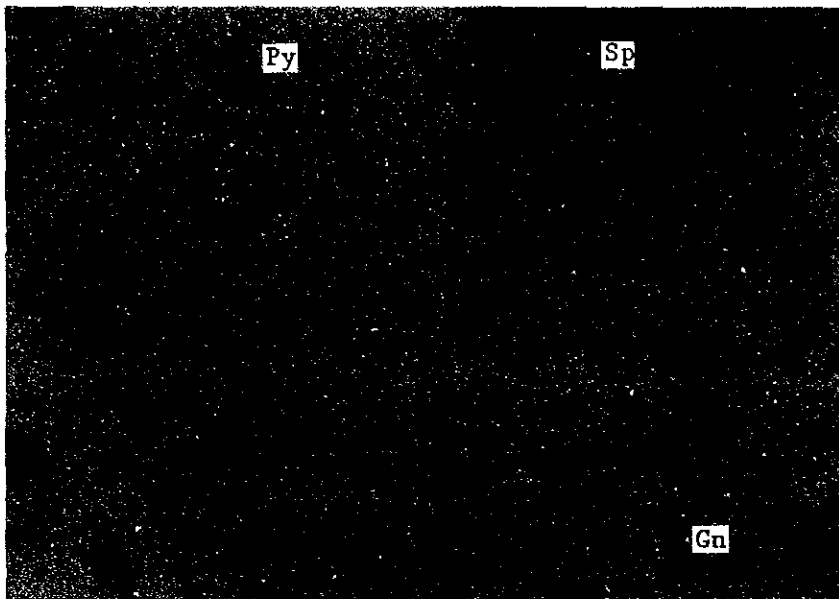
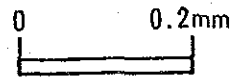


Photo. 3 Ore-A



Galena (Gn) existing with pyrite (Py)

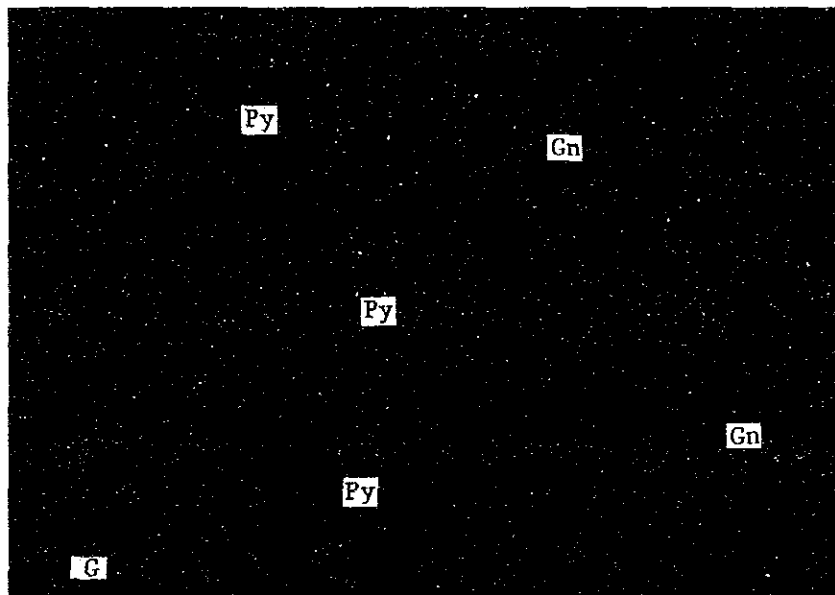
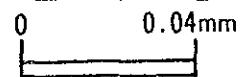


Photo. 4 Ore-A



Enlarged frame in photo. 3. The size of galena (Gn) is about 10 μ m. This part is analyzed by EPMA (refer to Annex IV (1)).

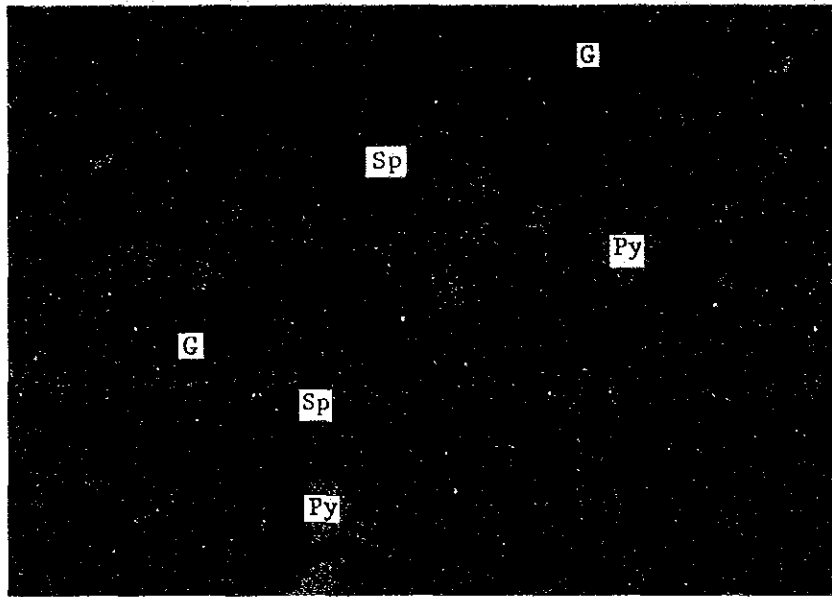
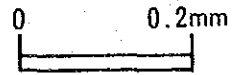


Photo.5 Ore-B



Pyrite (Py) and gangue rocks (G) existing within sphalerite (Sp).
The inside of the frame is analyzed by EPMA (refer to Annex IV (2)).

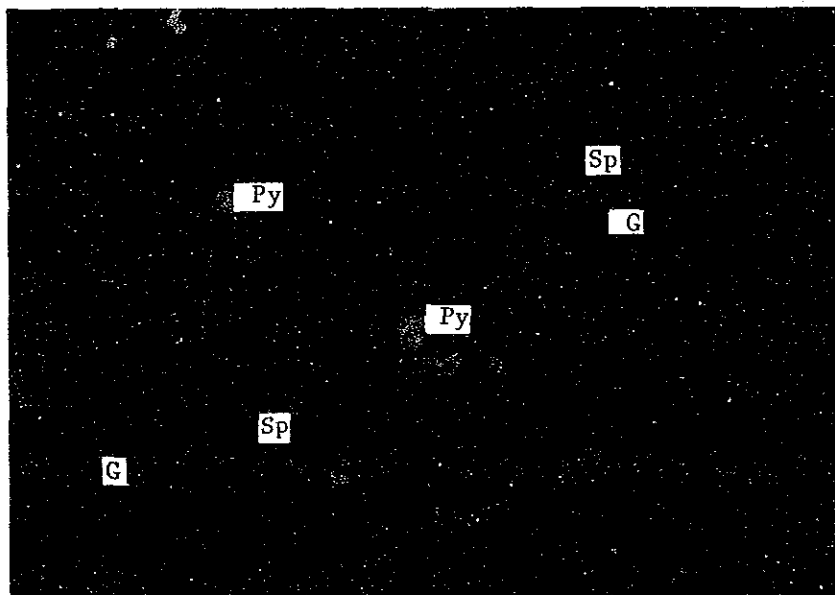


Photo.6 Ore-B



Pyrite (Py) and gangue rocks (G) existing within sphalerite.

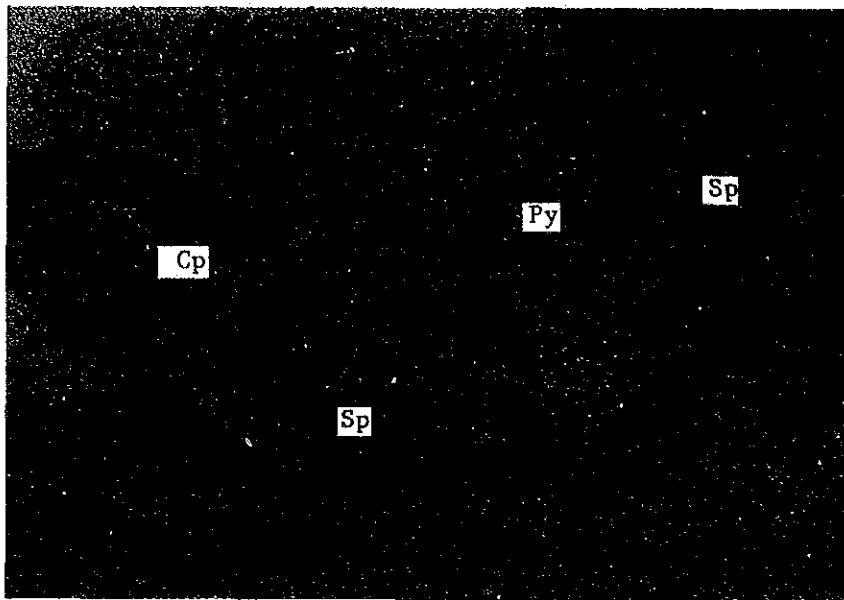
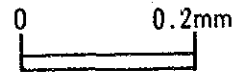


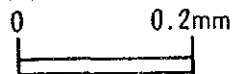
Photo. 7 Ore-C



Sphalerite (Sp), which includes chalcopyrite (Cp) in the shape of dots in parts, and pyrite (Py).



Photo. 8 Ore-C



Sphalerite (Sp) and Pyrite (Py)
The inside of the frame is analyzed by EPMA (refer to Annex IV (3))

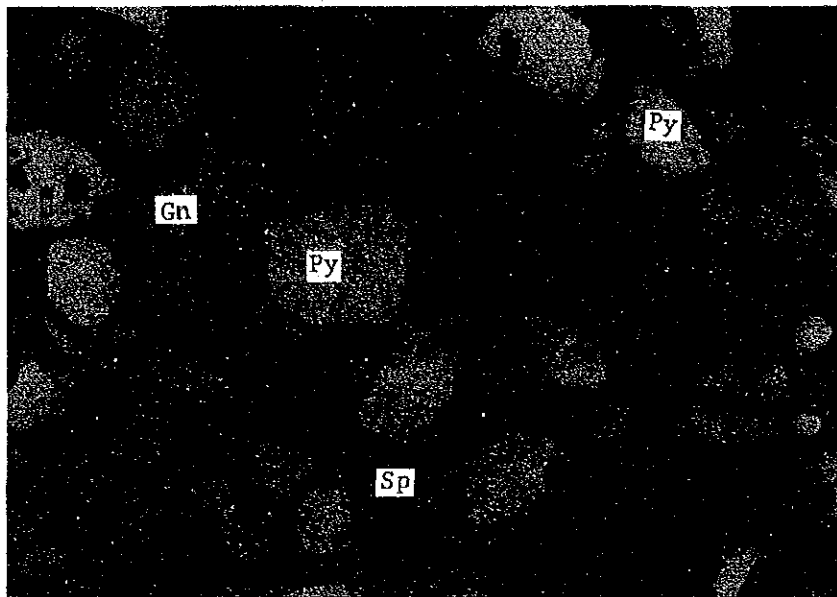


Photo. 9 Lead concentrate from Ore-M 

Almost all of pyrite (Py) mixed in is as middling with galena (Gn).

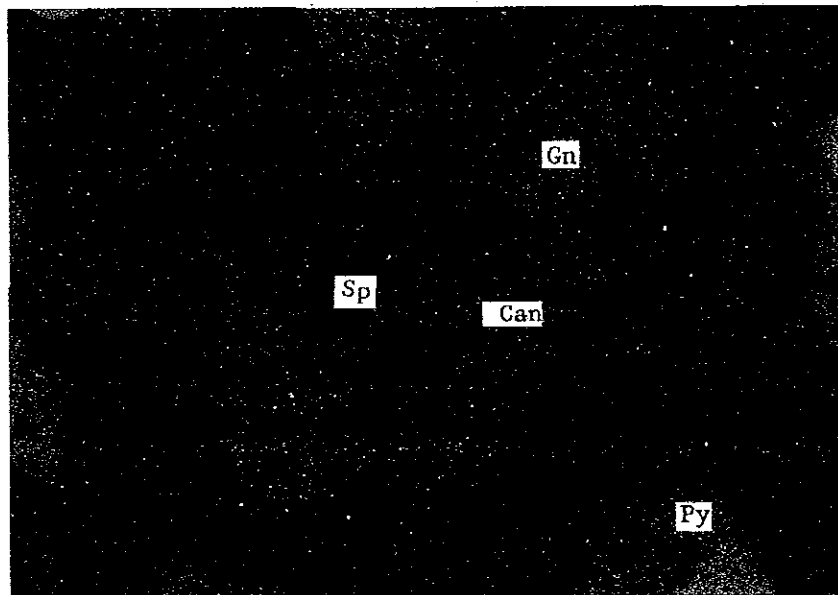



Photo. 10 Lead concentrate from Ore-M 

Canfieldite (Can) with a size of $9\ \mu\text{m}$ coexists with sphalerite (Sp).

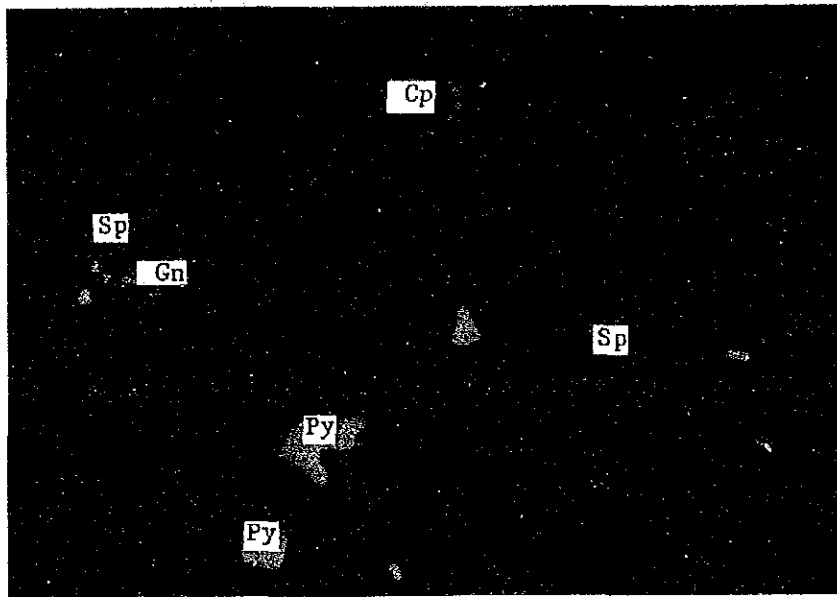
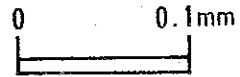


Photo.11 Zinc Concentrate from Ore-M



Sphalerite (Sp) includes chalcopyrite (Cp) in the shape of dots, and sphalerite (Sp) as middling with pyrite (py) and galena (Gn).

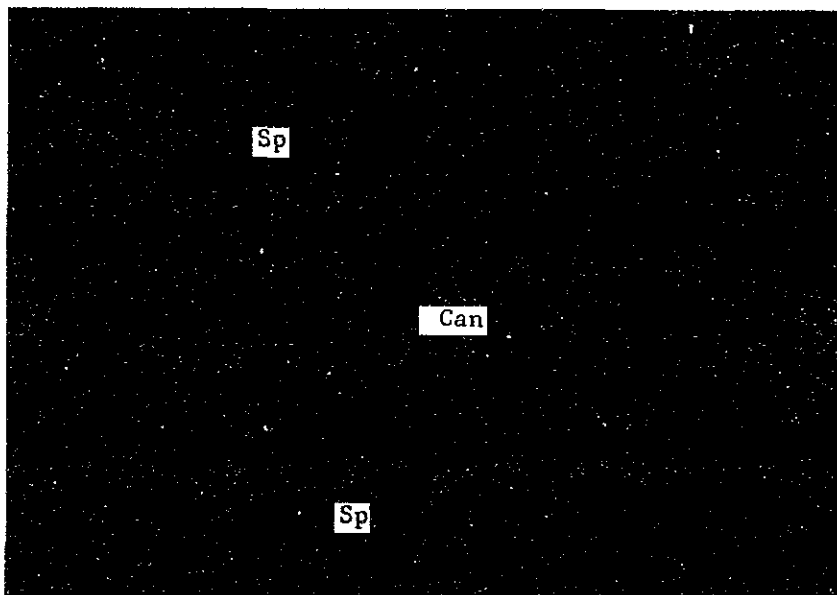
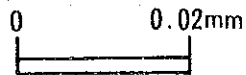


Photo.12 Zinc concentrate from Ore-M



Canfieldite (Can) with a size of $5\ \mu\text{m}$ in splalerite (Sp). The inside of the frame is analyzed by EPMA (refer to Annex IV (4)).

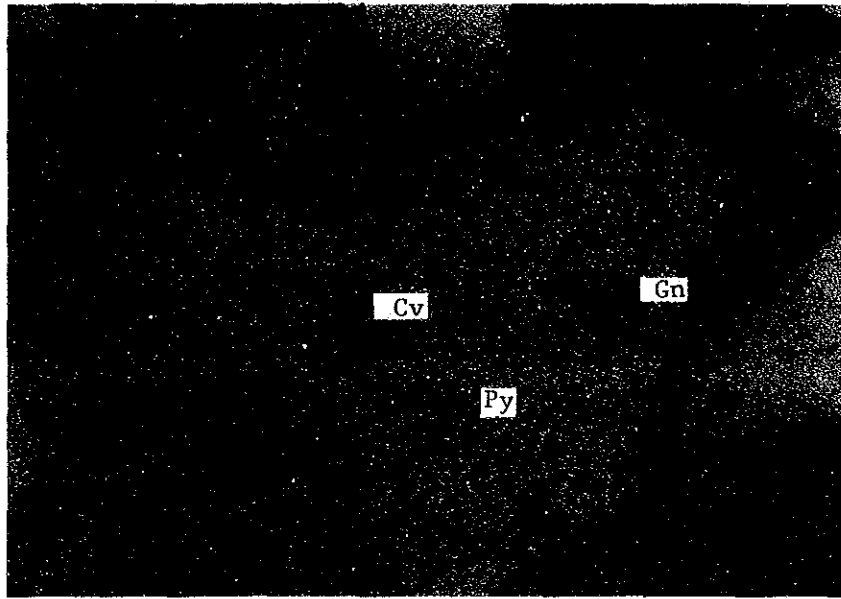
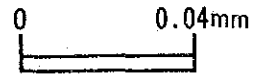


Photo. 13 Tailing of Ore-M



Galena (Gn) with a size of about $10\mu\text{m}$ and covellite (Cv) in pyrite (Py)

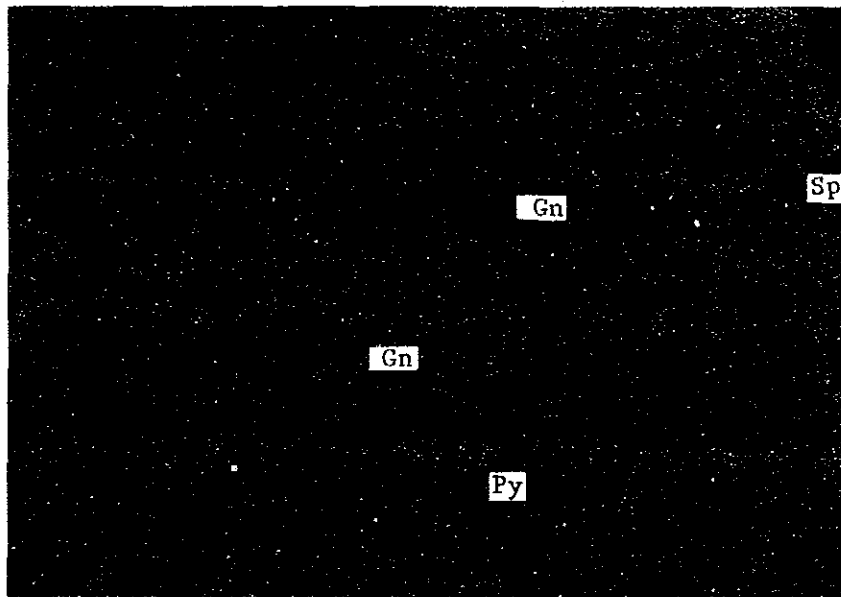
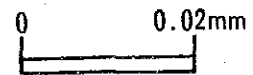


Photo. 14 Tailing of Ore-M



Galena (Gn) with a size of about $5\mu\text{m}$ and sphalerite (Sp) with a size of about $8\mu\text{m}$ which are included in pyrite (Py).

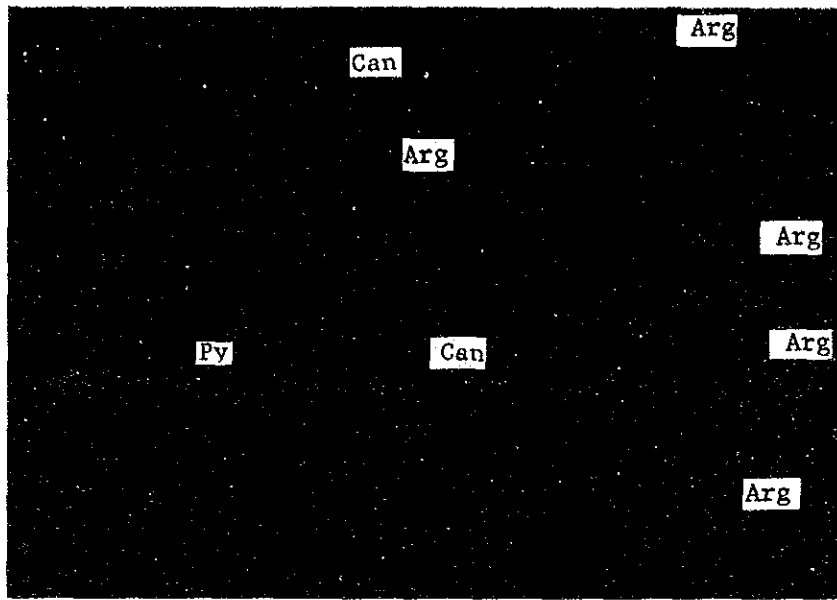


Photo.15 Massive pyrite

0 0.02mm

Canfieldite (Can) coexisting with argentite (Arg) in pyrite (Py).

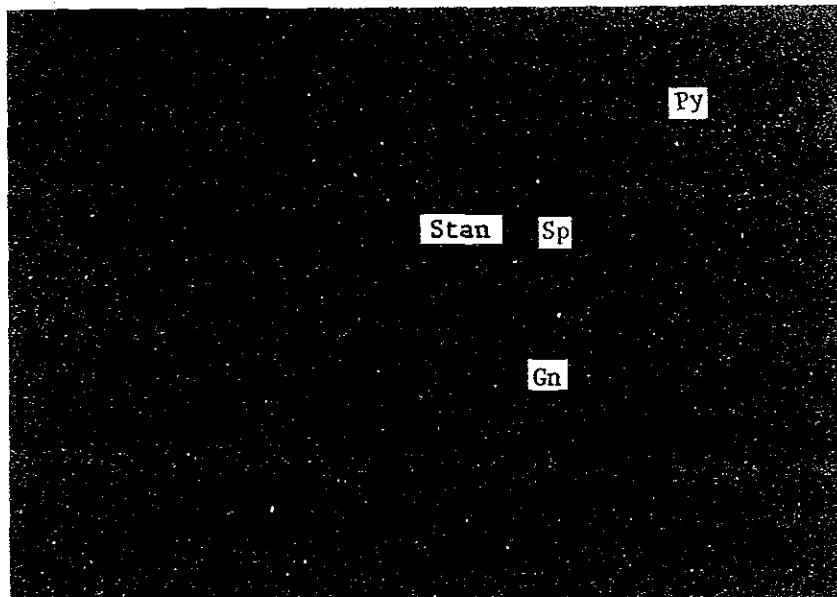


Photo.16 Massive pyrite

0 0.04mm

Stanrite (stan) and Sphalerite (Sp) coexisting with galena (Gn) in pyrite (Py).

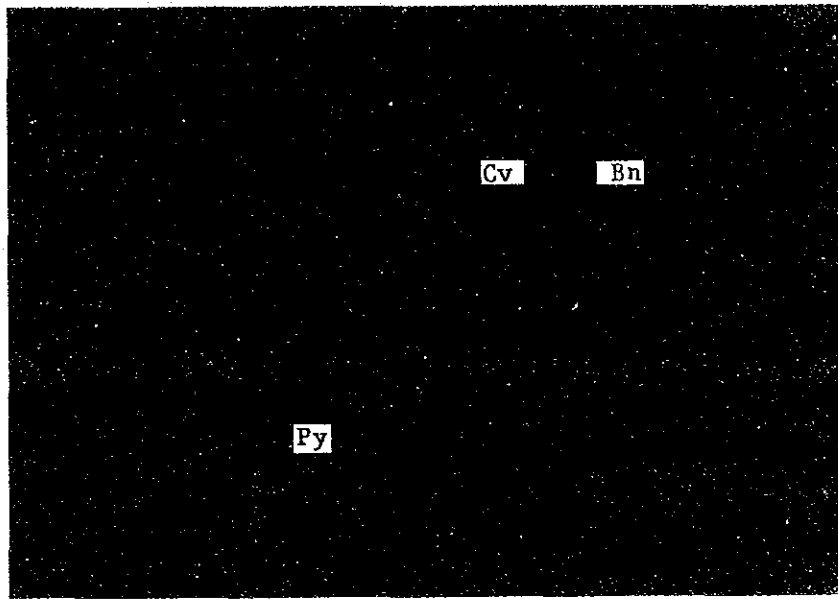


Photo.17 Massive pyrite

0 0.04mm

Bornite (Bn) and covellite (Cv) in pyrite (Py).

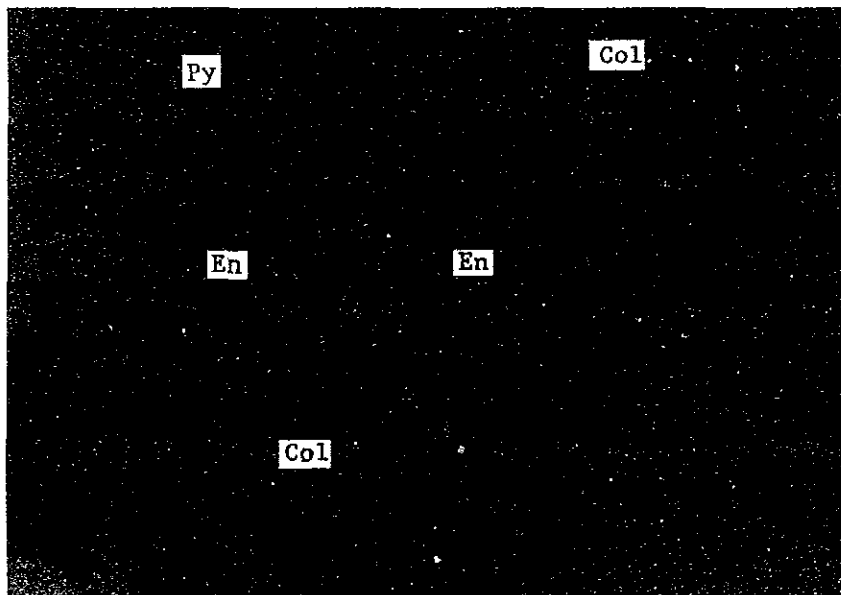
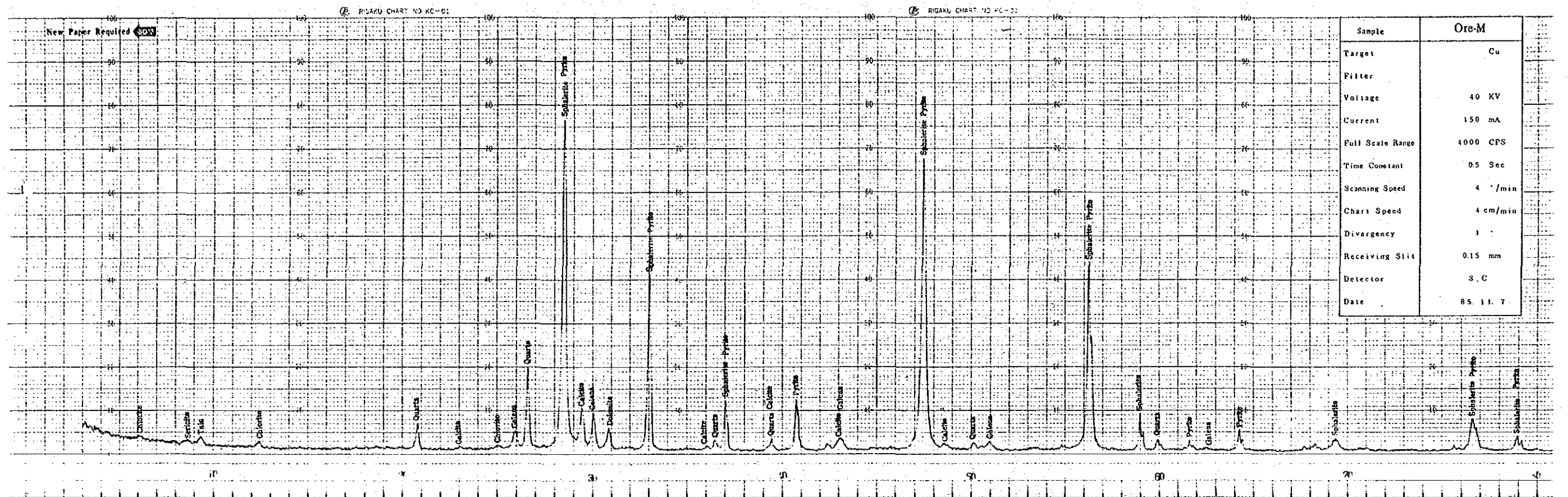


Photo.18 Massive pyrite

0 0.02mm

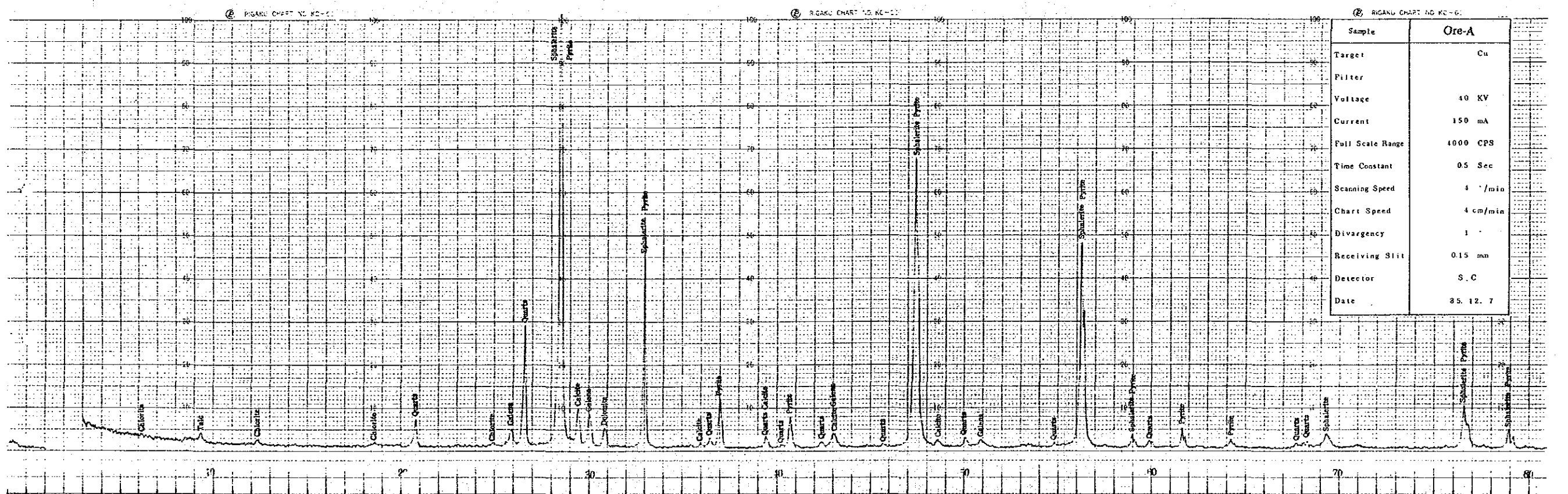
Colusite (Col) coexisting with enargite (En) in pyrite (Py).

III RESULT OF X-RAY DIFFRACTION TEST



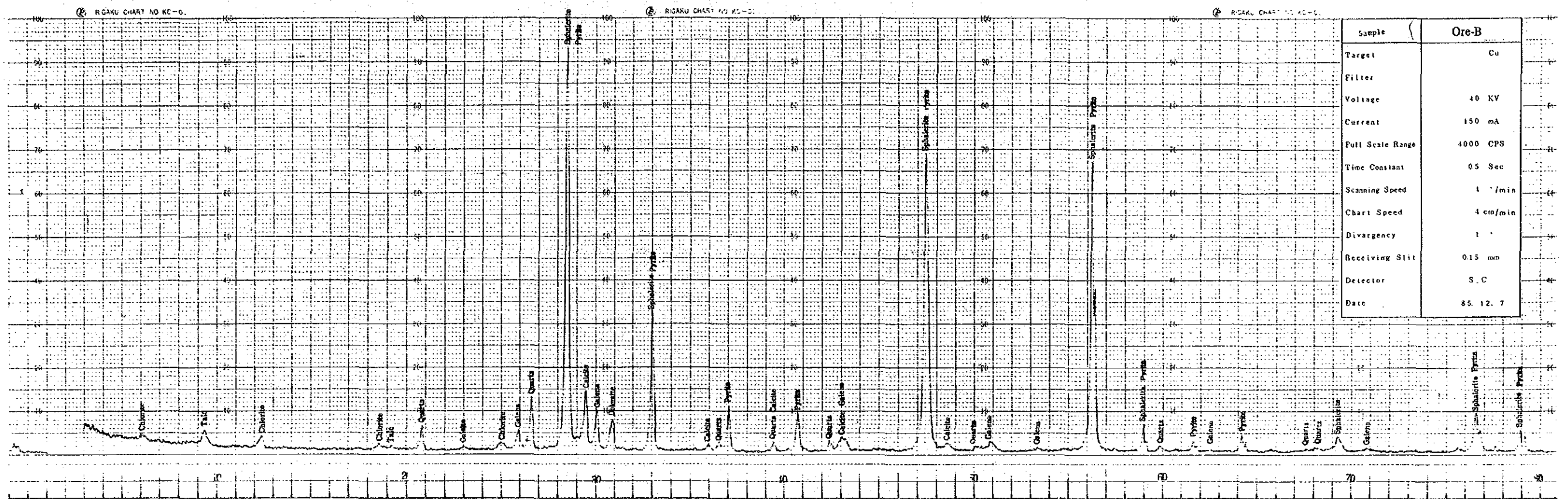
Sample	Ore-M
Target	Cu
Filter	
Voltage	40 KV
Current	150 mA
Full Scale Range	4000 CPS
Time Constant	0.5 Sec
Scanning Speed	4 /min
Chart Speed	4 cm/min
Divergency	1
Receiving Slit	0.15 mm
Detector	S.C
Date	85.11.7

Fig. 1 Ore-M



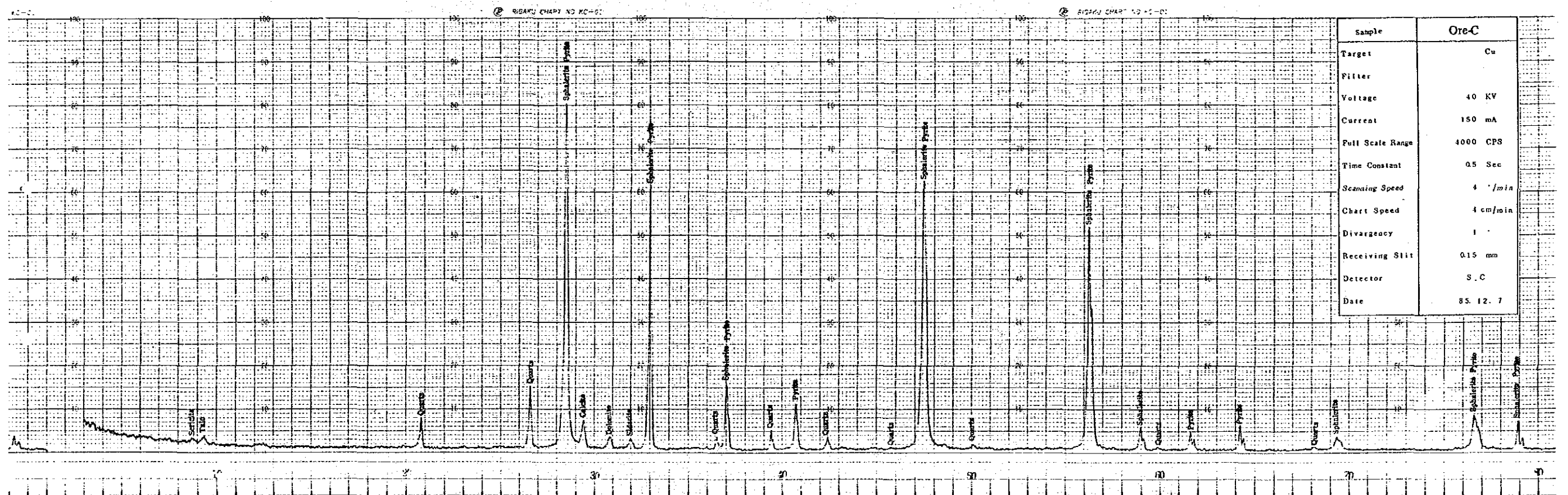
Sample	Ore-A
Target	Cu
Filter	
Voltage	40 KV
Current	150 mA
Full Scale Range	4000 CPS
Time Constant	0.5 Sec
Scanning Speed	4 /min
Chart Speed	4 cm/min
Divergency	1
Receiving Slit	0.15 mm
Detector	S.C
Date	85.12.7

Fig. 2 Ore-A



Sample	Ore-B
Target	Cu
Filter	
Voltage	40 KV
Current	150 mA
Full Scale Range	4000 CPS
Time Constant	0.5 Sec
Scanning Speed	4 /min
Chart Speed	4 cm/min
Divergency	1 °
Receiving Slit	0.15 mm
Detector	S. C
Date	85. 12. 7

Fig. 3 Ore-B



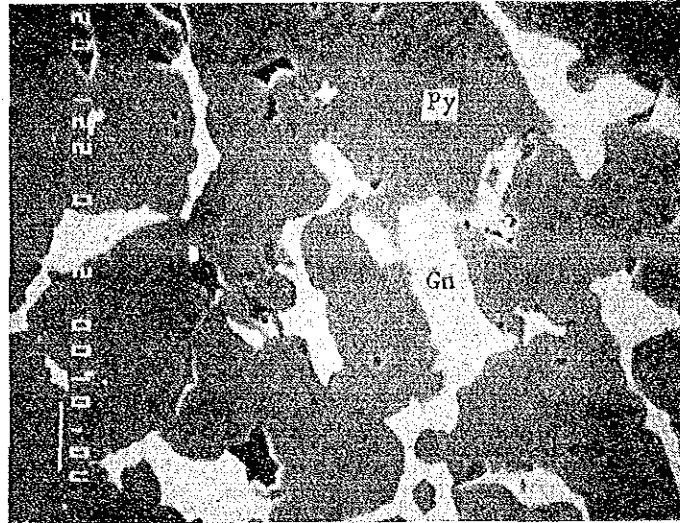
Sample	Ore-C
Target	Cu
Filter	
Voltage	40 KV
Current	150 mA
Full Scale Range	4000 CPS
Time Constant	0.5 Sec
Scanning Speed	4 /min
Chart Speed	4 cm/min
Divergency	1 °
Receiving Slit	0.15 mm
Detector	S. C
Date	85. 12. 7

Fig. 4 Ore-C

IV RESULT OF EPMA TEST

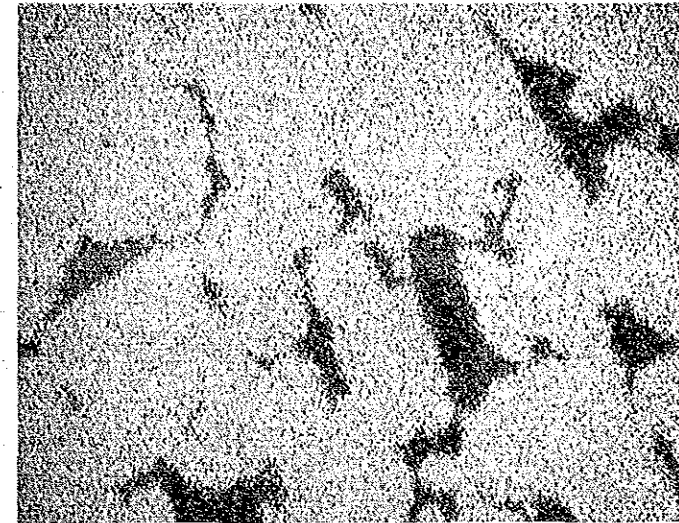
(1) Results of EPMA test

Sample	Ore-A
Acceleration voltage	20 kV
Electronic current	0.04 μ A
Magnification ratio	$\times 1200$



Scanning microscopic image

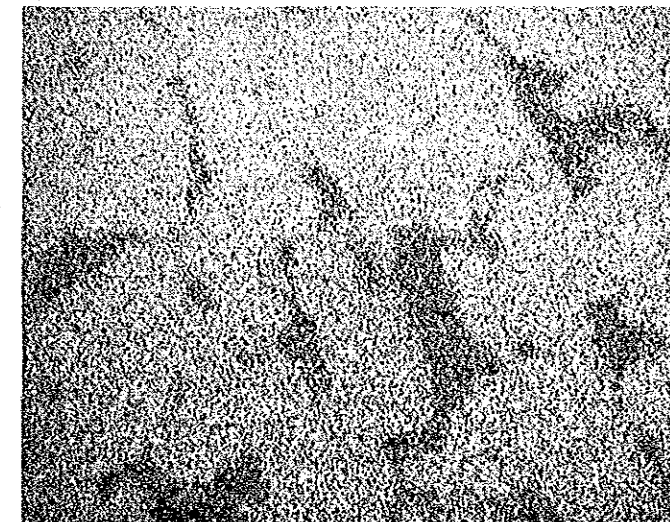
Gn; Galena (Pb,Bi) S
 Py; Pyrite FeS₂



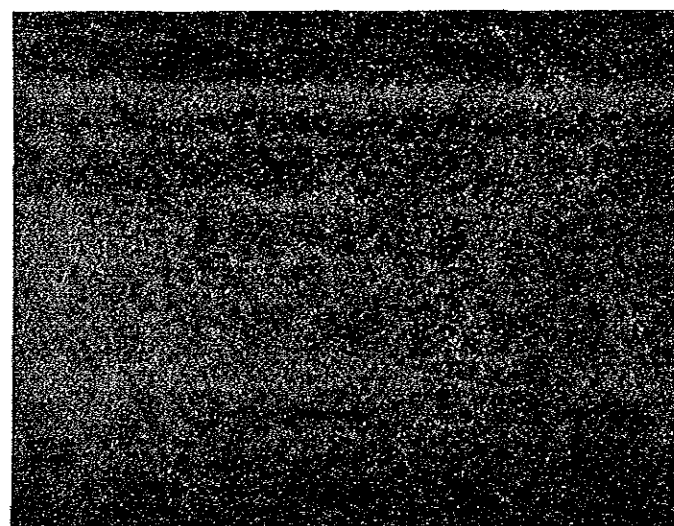
Fe X-ray image



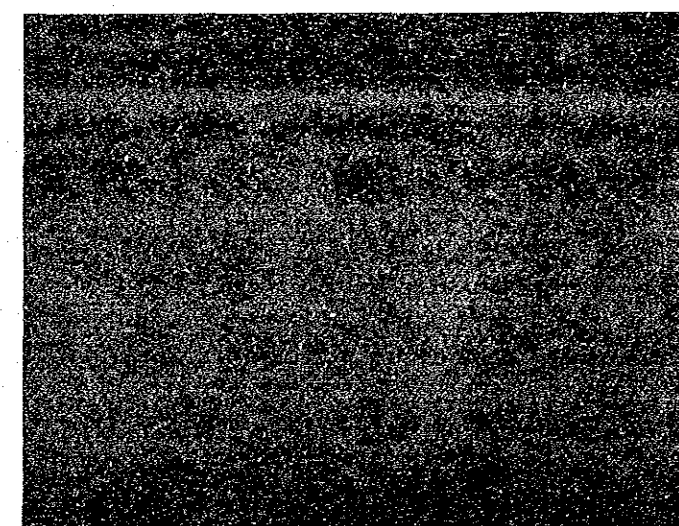
Pb X-ray image



S X-ray image



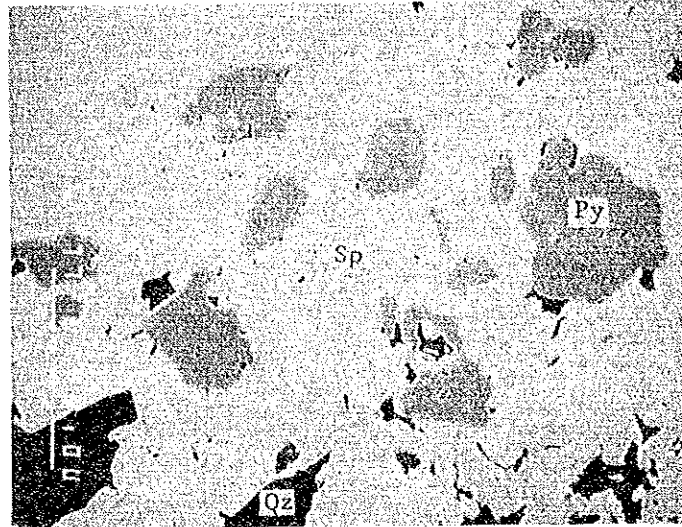
Bi X-ray image



Ag X-ray image

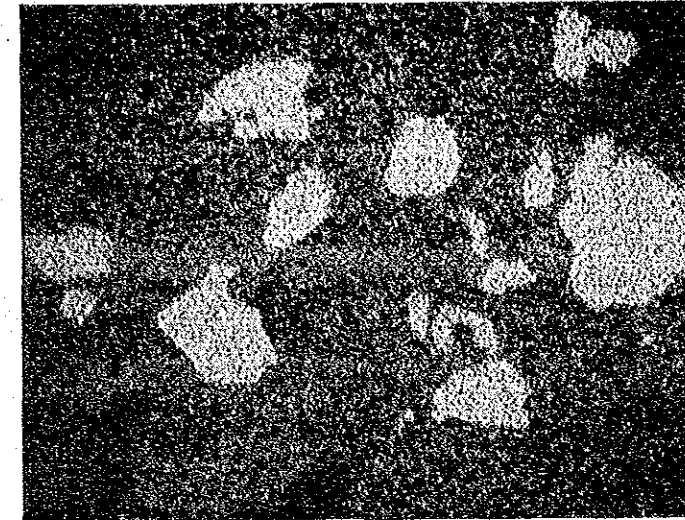
(2) Results of EPMA test

Sample	Ore-B
Acceleration voltage	20 kV
Electronic current	0.04 μ A
Magnification ratio	$\times 360$

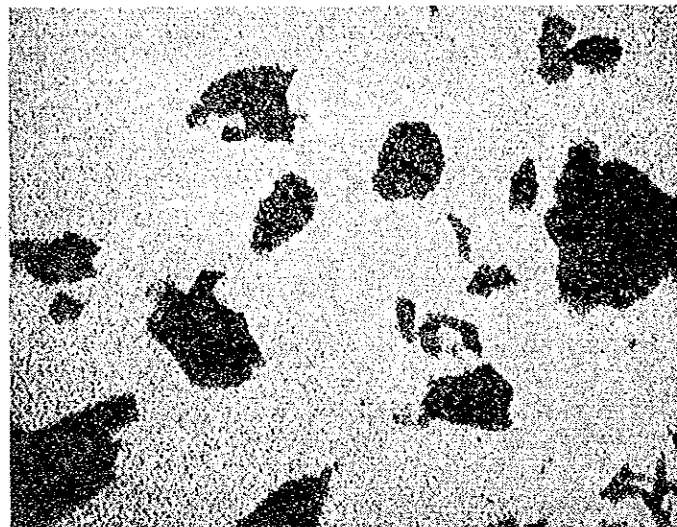


Scanning microscopic image

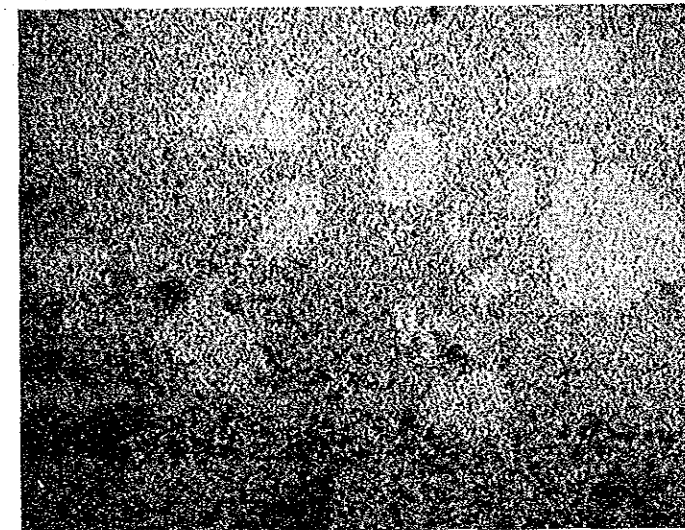
Sp; Sphalerite (Zn,Fe)S
Py; Pyrite FeS₂
Qz; Quartz SiO₂



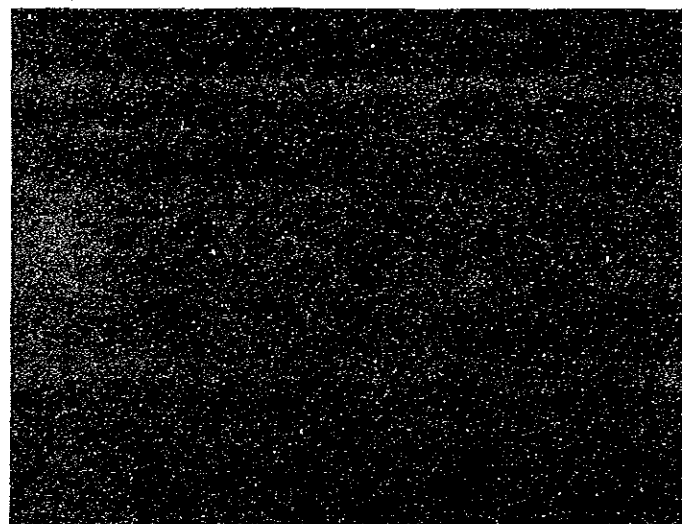
Fe X-ray image



Zn X-ray image



S X-ray image



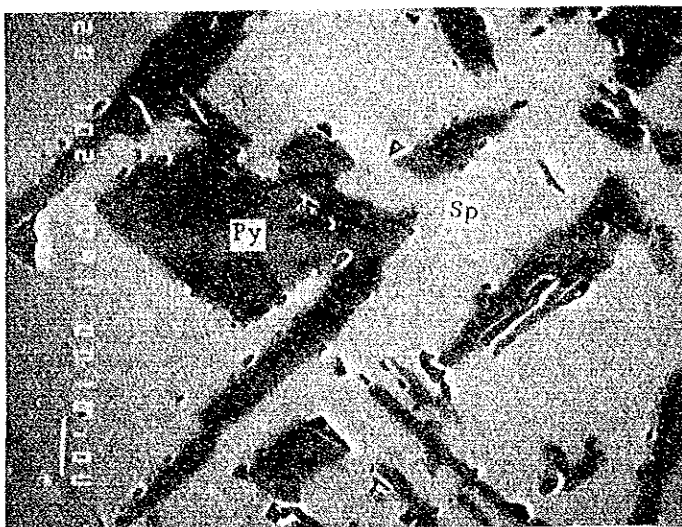
Ag X-ray image



Si X-ray image

(3) Results of EPMA test

Sample	Ore-C
Acceleration voltage	20 kV
Electronic current	0.04 μ A
Magnification ratio	$\times 1000$



Scanning microscopic image

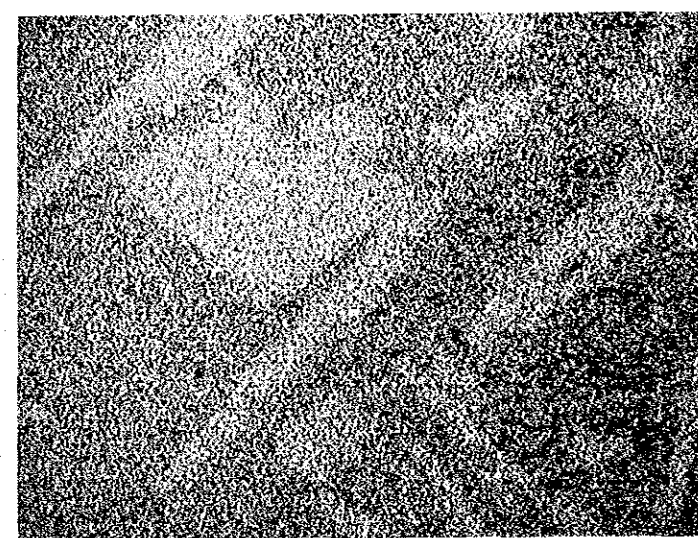
Sp; Sphalerite (Zn,Fe) S
 Py; Pyrite FeS₂



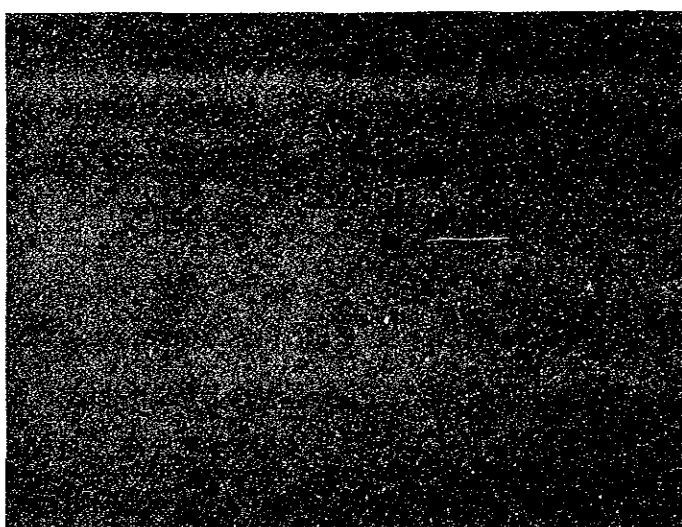
Fe X-ray image



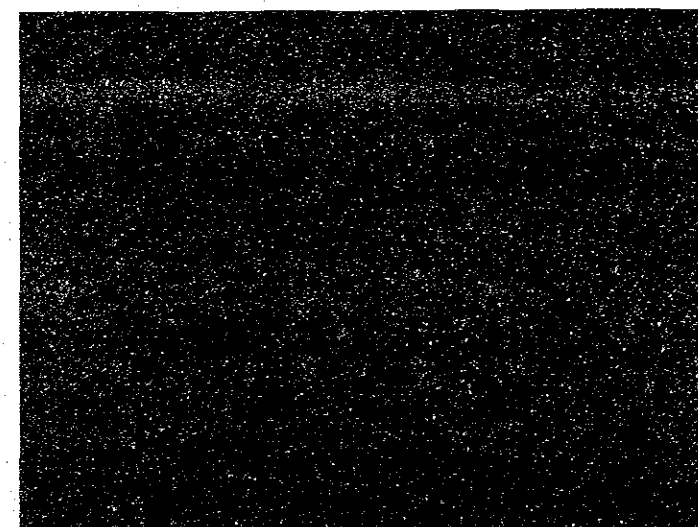
Zn X-ray image



S X-ray image



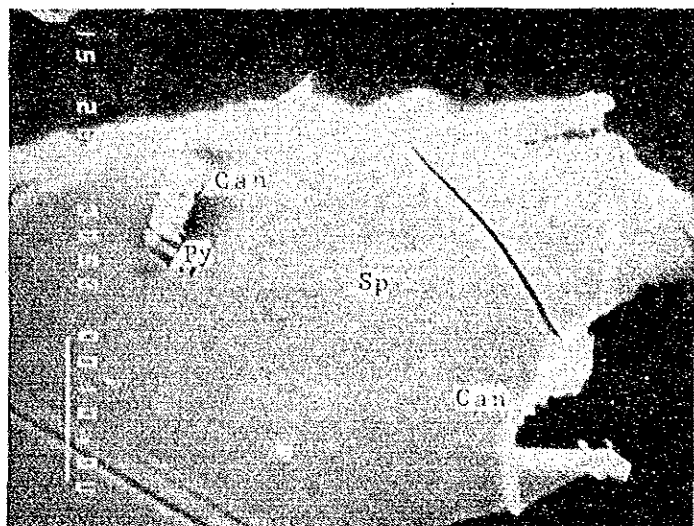
Cd X-ray image



Ag X-ray image

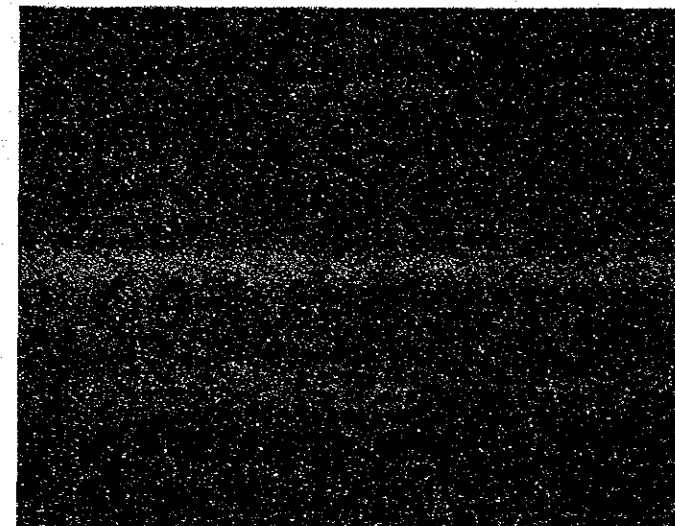
(4) Results of EPMA test

Sample	Zn Conc.
Acceleration voltage	15 kV
Electronic current	0.03 μ A
Magnification ratio	$\times 2600$

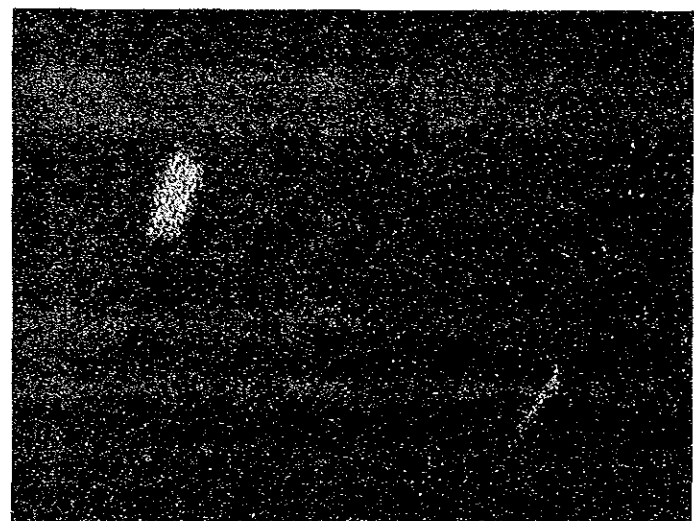


Scanning microscopic image

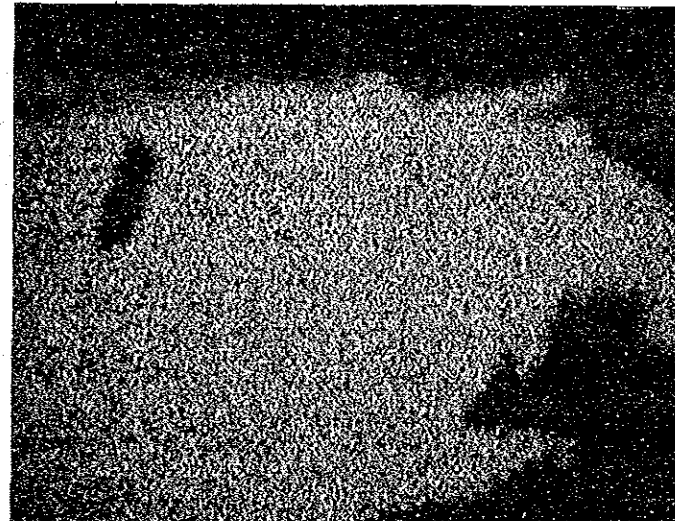
Sp; Sphalerite (Zn,Fe)S
 Can; Canfieldite $4Ag_2S(Sn,Ge)S_2$
 Py; Pyrite FeS_2



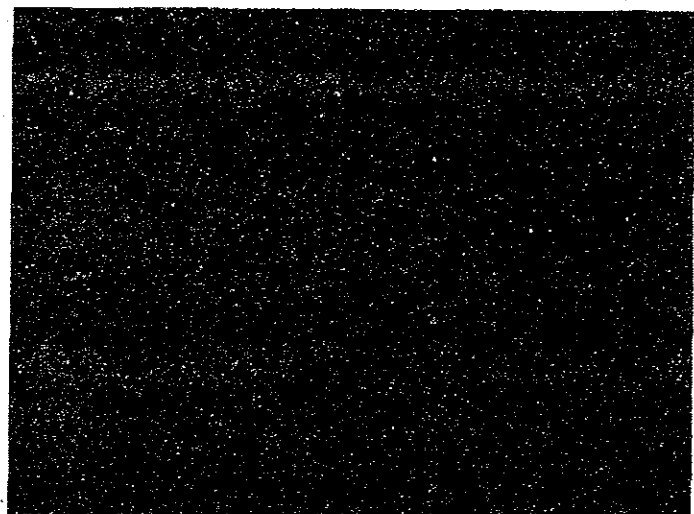
Sn X-ray image



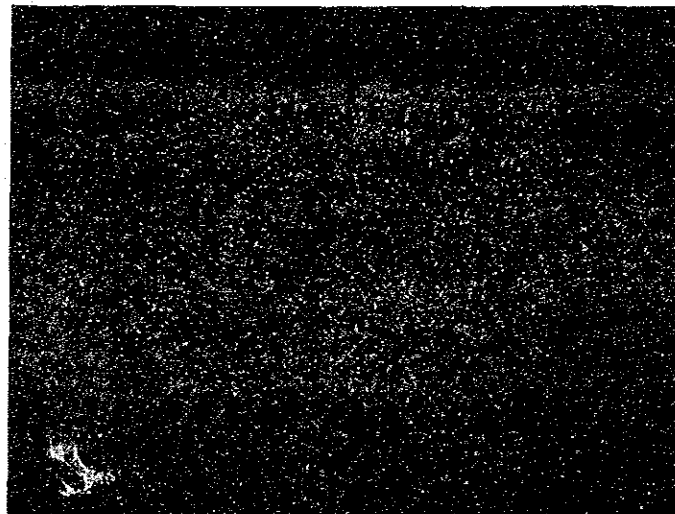
Ag X-ray image



Zn X-ray image



Ge X-ray image



S X-ray image

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