

Occurrence of the colusite group minerals at the Bor ore district

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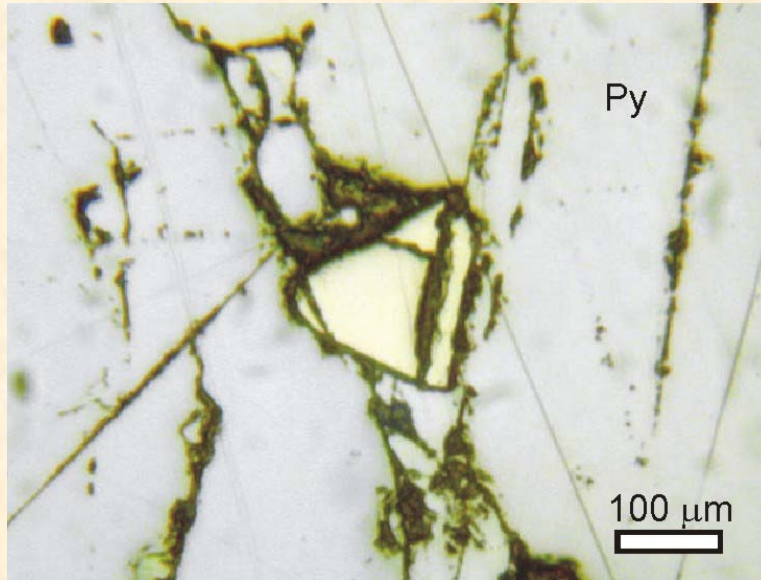
- $M_{34\pm x}S_{32}$,
M – Cu, V, As, Sb, Sn, Ge, Fe, $x \leq 3$
- Originated at an elevated oxidation potential
 - presence of As^{5+} , Sb^{5+} , Sn^{4+} , Ge^{4+} , Te^{4+} , Cu^{2+}
- Small amounts of the colusite group minerals occur in the ore from Bor ore district

Mineral: **Sulvanite**

Chem. formula: Cu_3VS_4 ($\text{Cu}_{24}\text{V}_8\text{S}_{32}$)

Result of EMPA-EDS:

Cu	52.65
V	12.75
Fe	-
Ge	-
Sn	-
As	0.41
Sb	-
W	-
Te	-
S	34.18
Total:	99.99



Air,
parallel Nicols

Mineral: **Arsenosulvanite**

Chem. formula: $\text{Cu}_{24}\text{V}_2\text{As}_6\text{S}_{32}$

Result of EMPA-EDS:

Cu 50.45

V 3.35

Fe -

Ge 0.75

Sn -

As 13.17

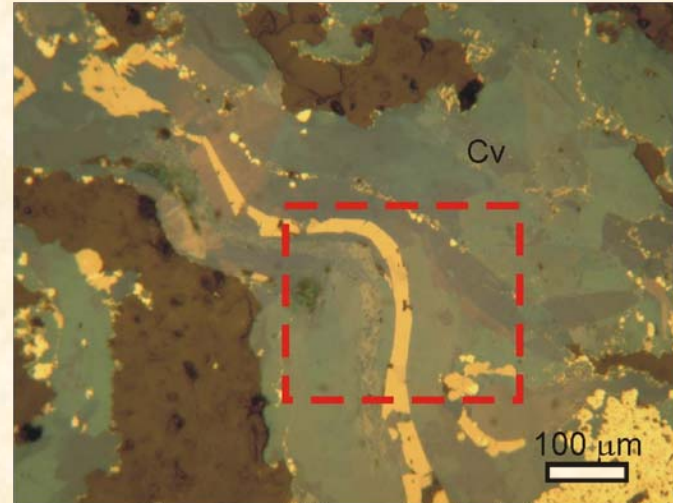
Sb -

W -

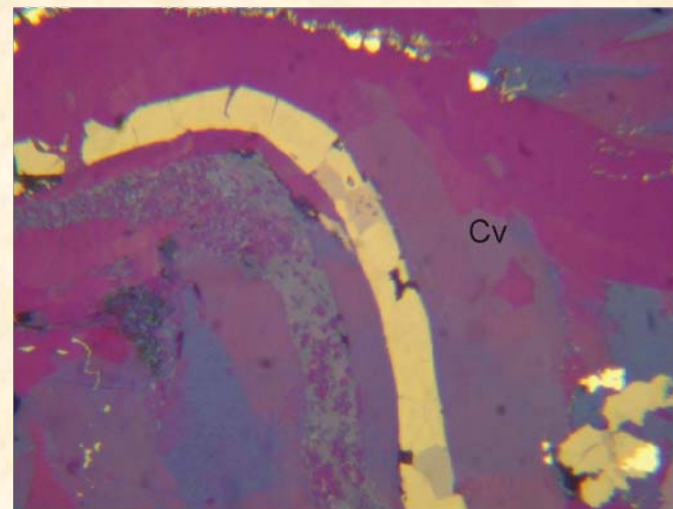
Te -

S 32.30

Total: 100.00



Air,
parallel Nicols



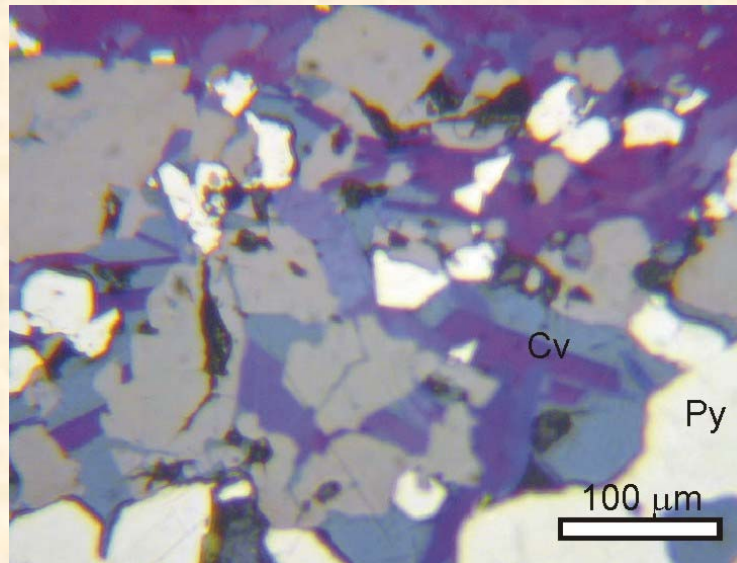
Oil,
parallel Nicols

Mineral: **Colusite (As-rich)**

Chem. formula: $\text{Cu}_{24+x}\text{V}_2(\text{As,Sb})_{6-x}(\text{Sn,Ge})_x\text{S}_{32}$

Result of EMPA-EDS:

Cu	50.00
V	2.97
Fe	0.73
Ge	0.43
Sn	2.05
As	11.21
Sb	-
W	-
Te	-
S	32.30
Total:	100.00



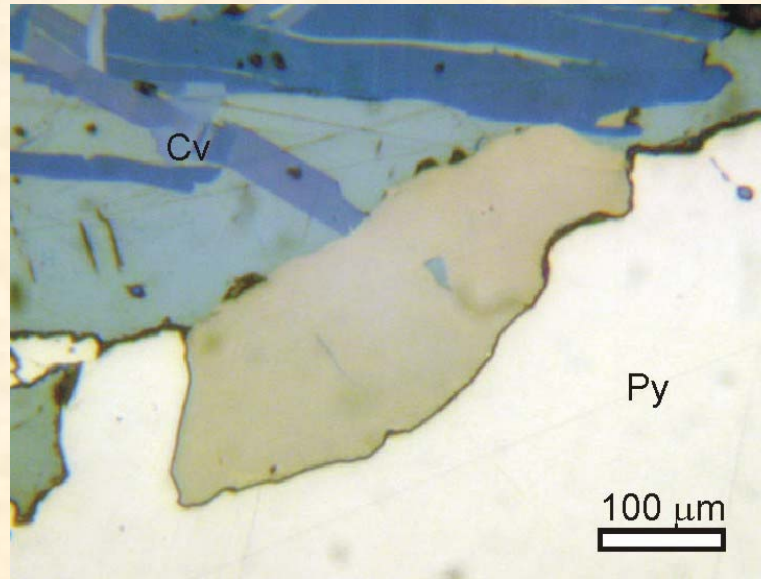
Oil,
parallel Nicols

Mineral: **Colusite (Sn-rich)**

Chem. formula: $\text{Cu}_{24+x}\text{V}_2(\text{As,Sb})_{6-x}(\text{Sn,Ge})_x\text{S}_{32}$

Result of EMPA-EDS:

Cu	48.58
V	2.66
Fe	0.20
Ge	-
Sn	6.81
As	9.41
Sb	-
W	-
Te	-
S	32.34
Total:	100.00



Air,
parallel Nicols

Mineral: **W-germanit (Rakicit?)**

Germanit , $\text{Cu}_{26}\text{Fe}_4\text{Ge}_4\text{S}_{32}$

Ovamboit, $\text{Cu}_{20}(\text{Fe,Cu,Zn})_6\text{W}_2\text{Ge}_6\text{S}_{32}$

Chem. formula: $\text{Cu}_{24}\text{Ge}_4\text{W}_4\text{S}_{32}$

Result of EMPA-EDS:

Cu 44.21

V 0.50

Fe -

Ge 7.86

Sn -

As 0.20

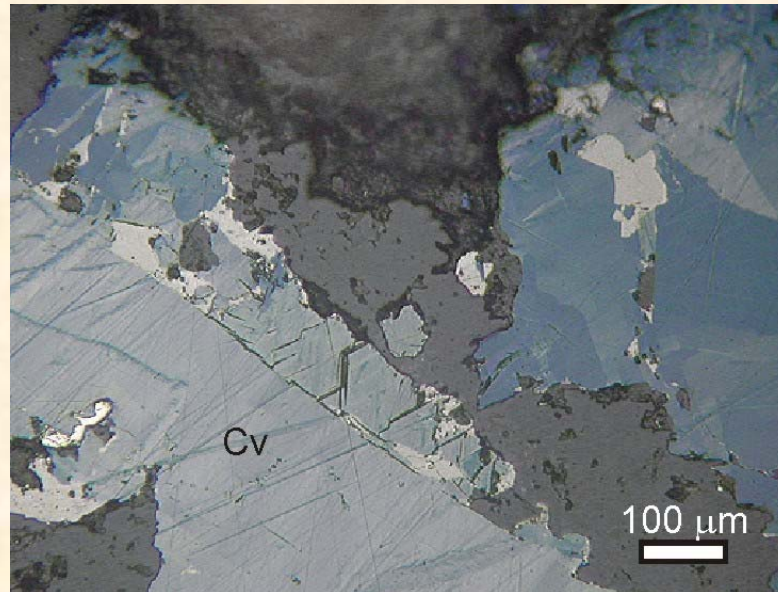
Sb -

W 18.92

Te 0.40

S 27.79

Total: 99.99



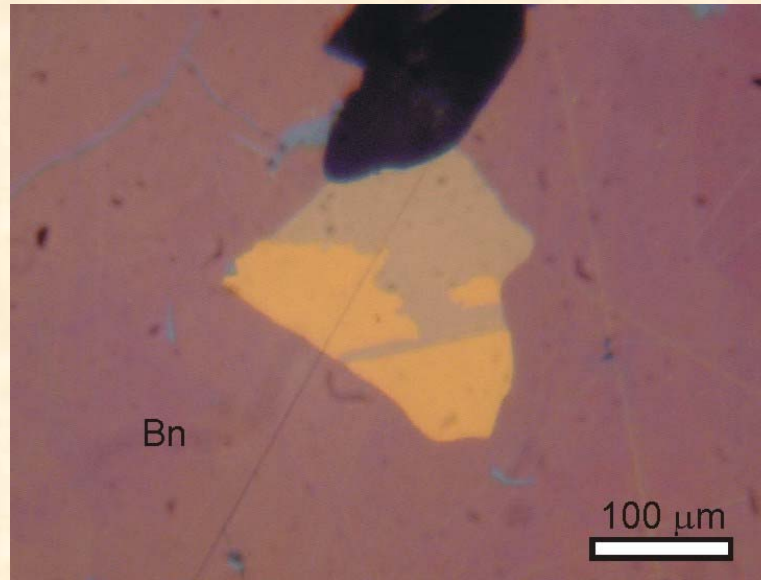
Air,
parallel Nicols

Mineral: **Mawsonite**

Chem. formula: $\text{Cu}_6\text{Fe}_2\text{SnS}_8$

Result of EMPA-EDS:

Cu	45.15
V	-
Fe	11.47
Ge	-
Sn	13.37
As	-
Sb	0.80
W	0.30
Te	-
S	28.87
Total:	100.00



Oil,
parallel Nicols