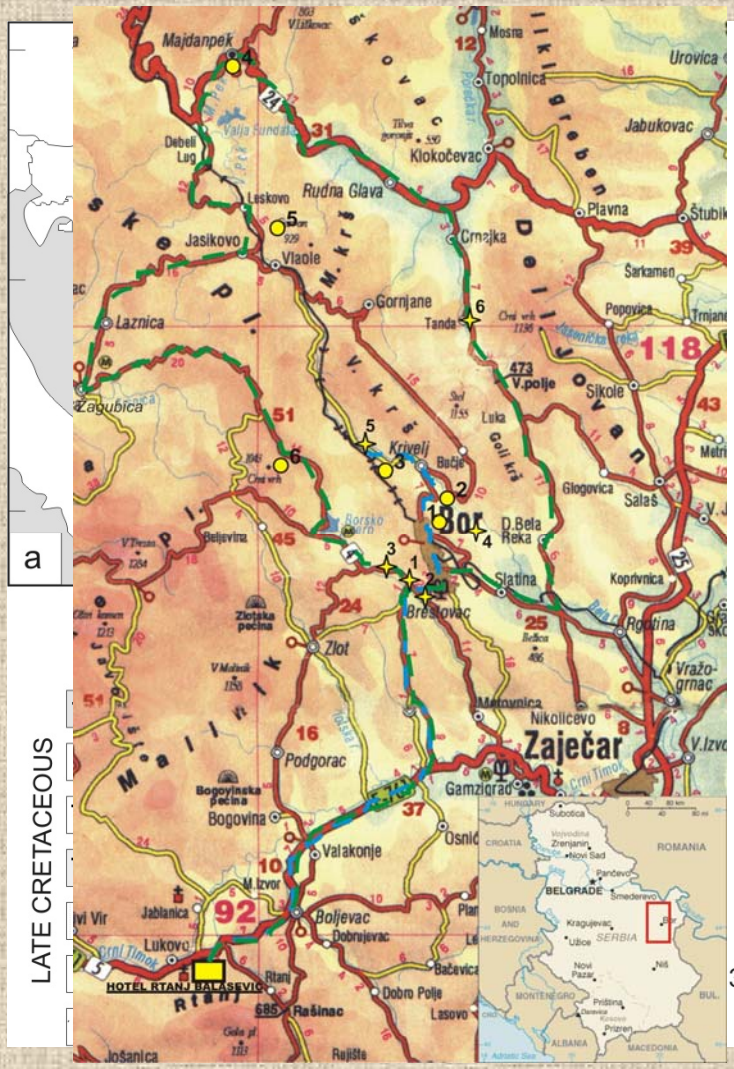
MINERALOGY OF THE ČOKA MARIN POLYMETALLIC DEPOSIT, BOR ORE DISTRICT, SERBIA

Aleksandar Pačevski, Ljubomir Cvetković & Periša Živković

GEOLOGY

Čoka Marin (Cu, Au, Ag, Zn, Pb) deposit – high-sulfidation epithermal

Resources: 2.13 Mt Cu-pyrite ore and 0.29 Mt of the polymetallic ore (Jelenković & Koželj 2001).



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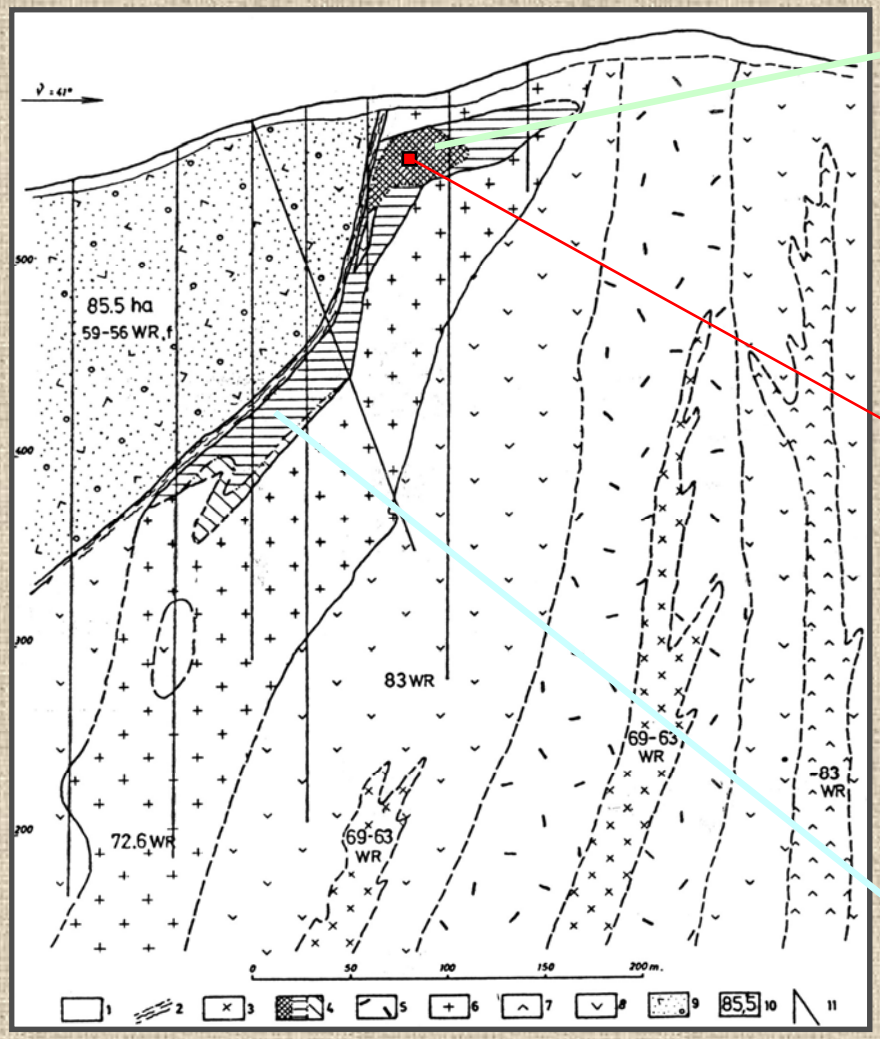
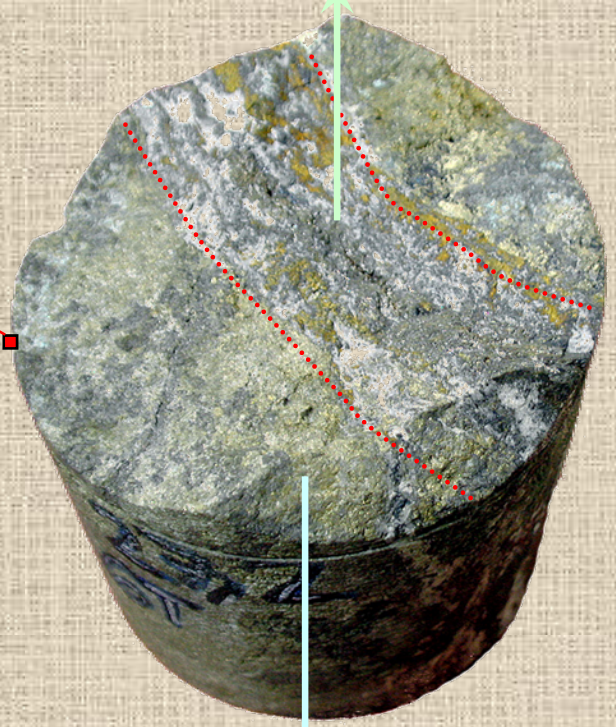


Cross-section through the orebody 1 of the Čoka Marin deposit (Karamata et al. 1997).

Polymetallic ore (late stage)

Py, Ccp, Sp, Gn, Brt



Cu-pyrite ore (main stage)

Py, Luz, Eng, Brt

MATERIAL: **116 samples** (+ 87 polish sections)

GENERAL MINERALOGICAL FEATURES OF THE MAIN ORE MINERALS:

- Pyrite
- Cu-minerals
- Pb-Zn minerals
- Au-Ag minerals

PYRITE

Texture:

Fine-grained

Colloform pyrite

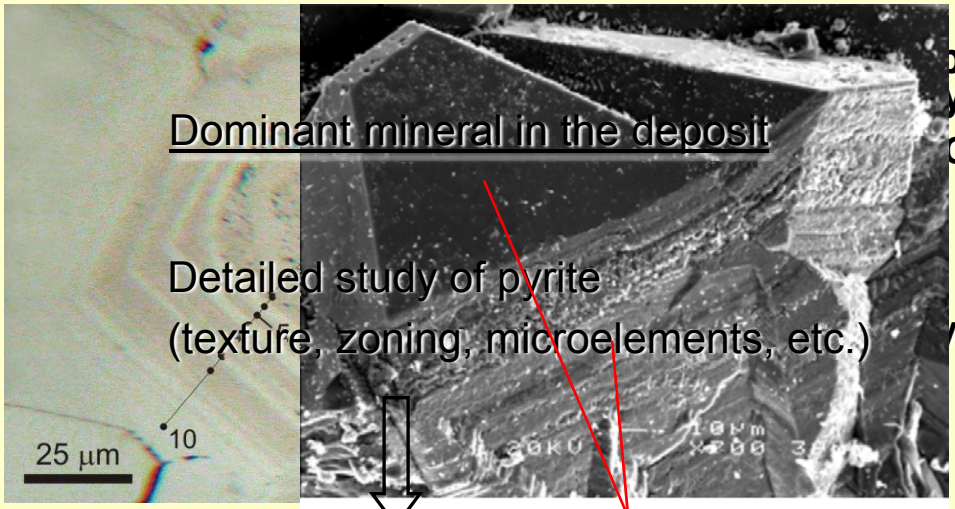
Idiomorphic pyrite

Porous (“spongy pyrite”)

Framboidal (“mineralized bacteria”, raspberry-shaped)

Pseudomorphous

Color heterogenity (or fine intergrowth?)



Zoning:

Chemical zoning

Cu-pyrite

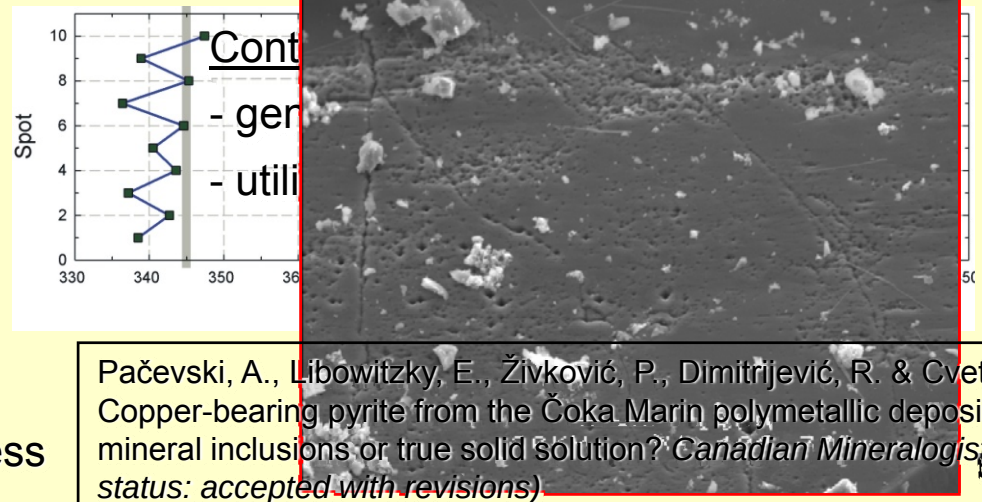
As-pyrite

Differences in porosity

Solid inclusions

Corrosion (zonar resorption)

Interruption of the growth process



Pačevski, A., Libowitzky, E., Živković, P., Dimitrijević, R. & Cvetković, Lj.: Copper-bearing pyrite from the Čoka Marin polymetallic deposit, Serbia: mineral inclusions or true solid solution? *Canadian Mineralogist (current status: accepted with revisions)*.

Various pyrite features within a sample (examples: 38/204.0, 445/209.9, H1/161.0)

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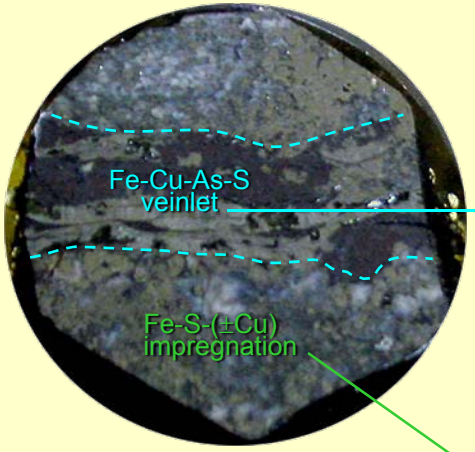
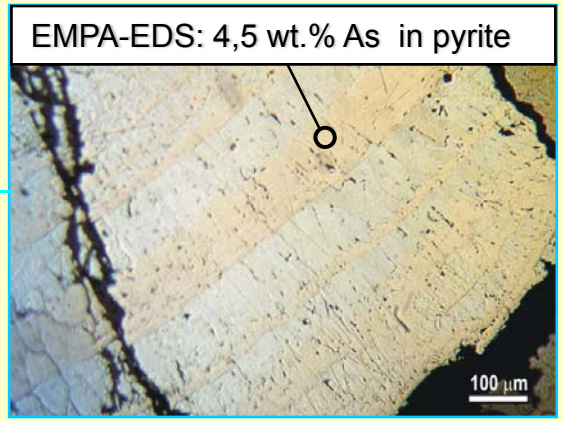
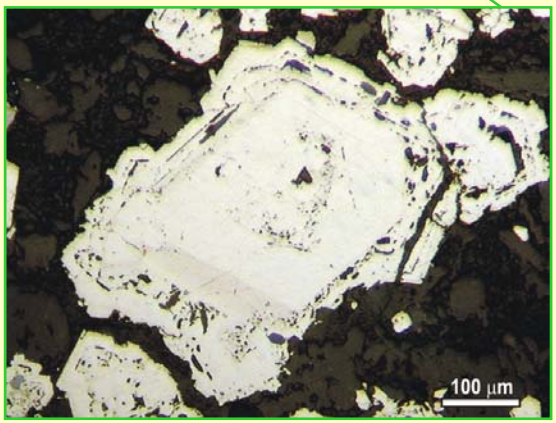
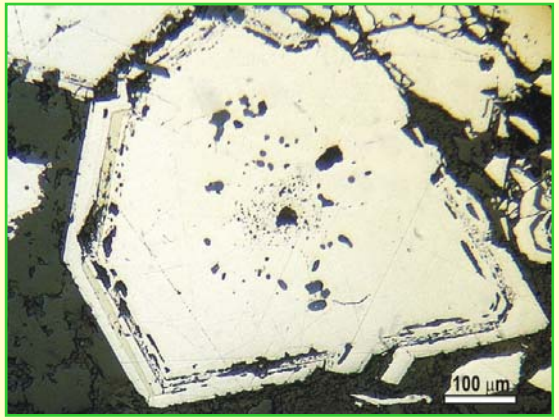
Polish section (diameter 2.54 cm)









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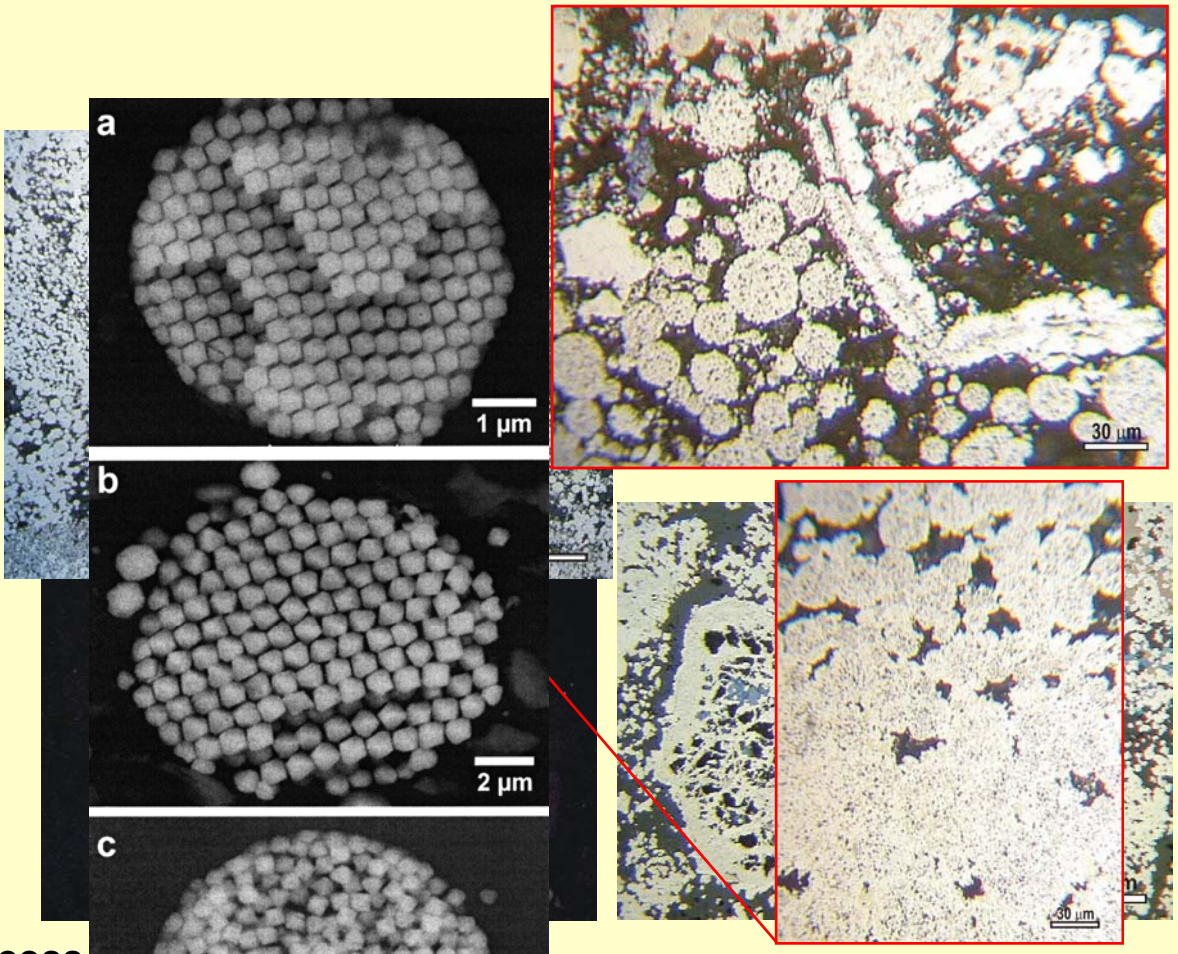

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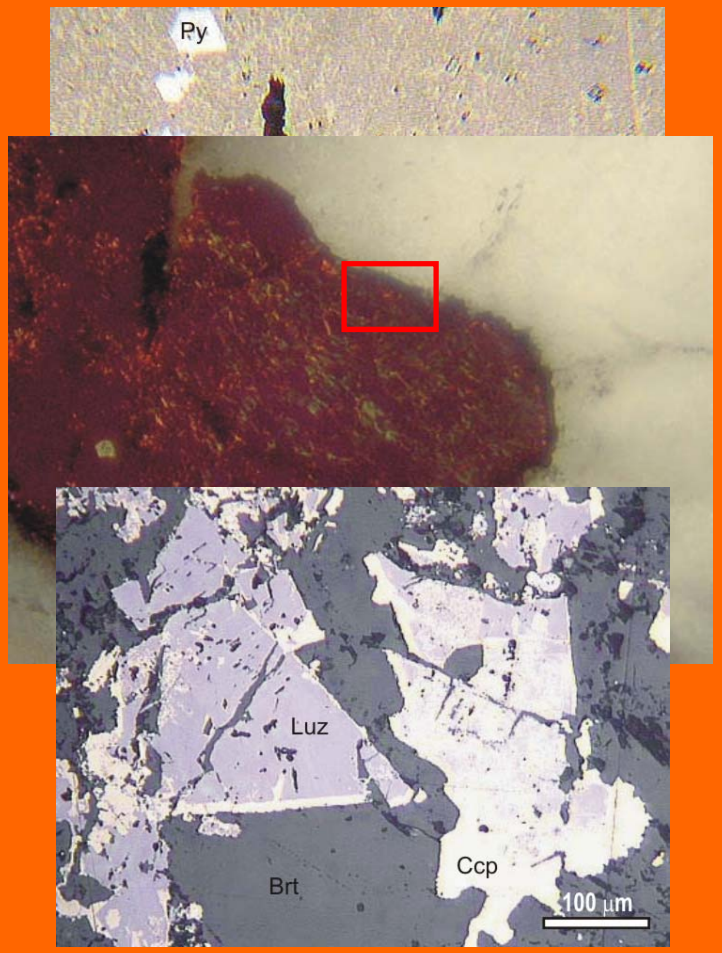
BSE image of differently arranged framboids (Ohfuji et al, 2005)

Cu minerals

Luzonite, Cu_3AsS_4
Enargite, Cu_3AsS_4
Chalcopyrite, $CuFeS_2$
Bornite, Cu_5FeS_4

Covellite, CuS
Tetrahedrite, $Cu_{12}(As,Sb)_4S_{13}$
Chalcocite, Cu_2S
Idaite, Cu_5FeS_6



Textural peculiarities:

(especially of the minerals of Cu-Fe-S system)

- Decompositions
- Metastability
- Heterogenity
- Replacements

⇨ Difficulties in phase identifications and genetic interpretation

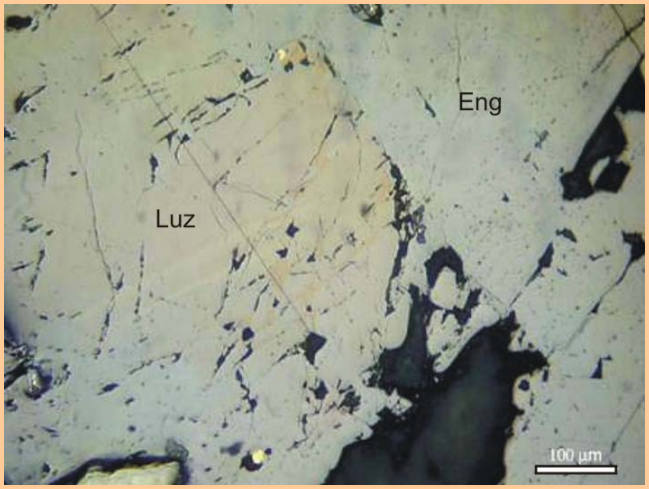
Pb-Zn minerals

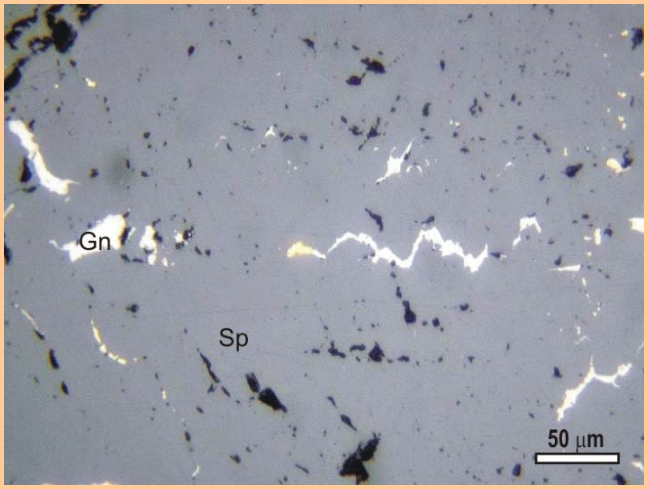
Galena

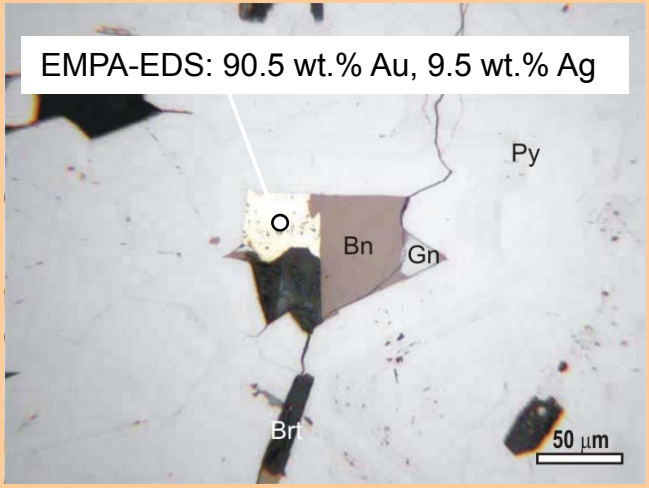
Sphalerite – differences in color (yellow-brown, green-yellow, black)

Pb-sulfosalts (sparse)

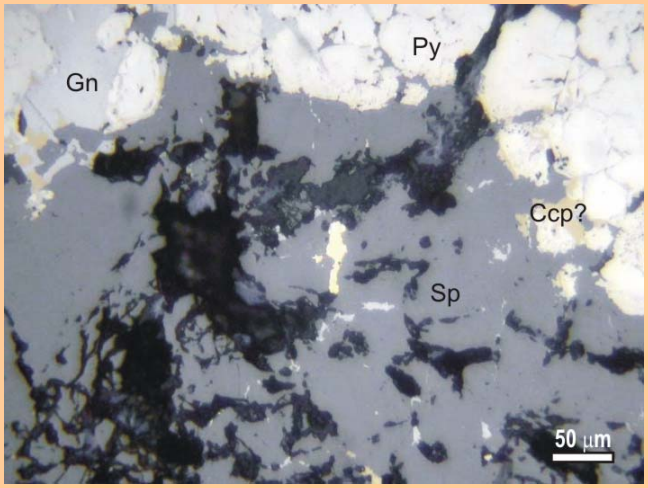
Au-Ag minerals





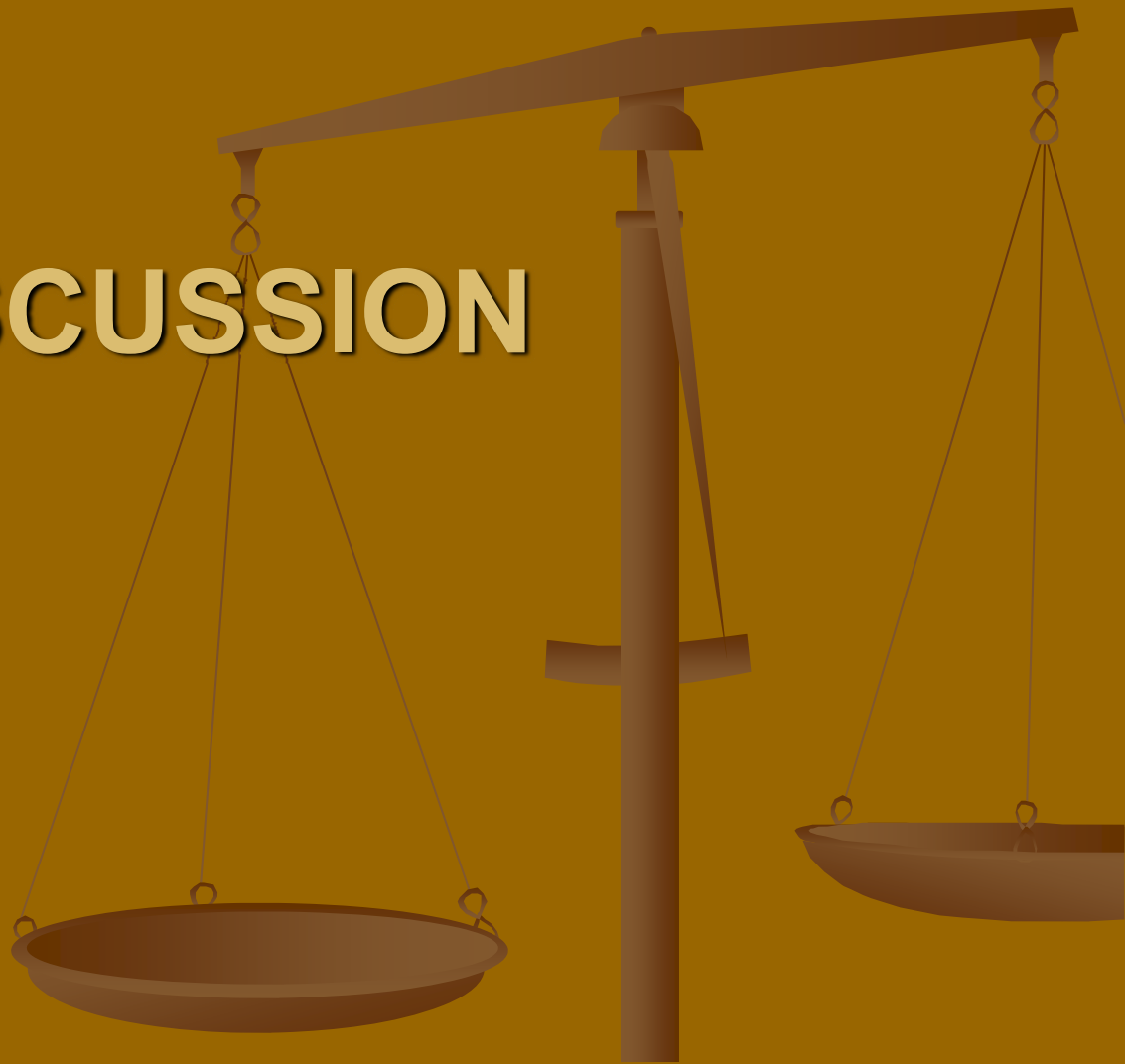


Cu-pyrite ore (main stage)



Polymetallic ore (late stage)

DISCUSSION



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- Jelenković, R. & Koželj, D. (2001): Program of the strategic consolidation of the RTB Bor – part Geology. - Fund of Professional Documentation of the Ministry of Mining and Energy of the Republic of Serbia. (in Serbian).
- Karamata, S., Živković, P., Pecskay, Z., Knežević, V. & Cvetković, V. (1997): Geological setting and age of the Čoka Marin polymetallic ore deposit (Eastern Serbia). - *Rom. J. Mineral Deposits* **78**: 79-84.
- Ohfuji, H., Boyle, A.P., Prior, D.J. & Rickard, D. (2005): *Structure of framboidal pyrite: An electron backscatter diffraction study*. - American Mineralogist **90**: 1693-1704.