PGE Concentrations Within Sulphide Mineralization Related to Ophiolite Volcanic Sequence

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PGE concentrations in the sulphide mineralization of ophiolite volcanic sequence are investigated in Perlati cooper deposit. The mineralization is developed in basaltic andesite rocks. The ore samples are analyzed using different chemical methods (chemical-spectral, laser photo ionic, atomic absorption spectrometry, emission spectroscopy etc.).

PGE concentrations are recognized in different samples. The most important aspects remain the identification of PGM associations. It is made use of scanning electron microscope and difractometric methods. The chemical preliminary treatment of sulphide phases is applied as well as. The pyrite disintegration facilitated the PGM identification.

The attached pictures show the structural relationships between pyrite and other ore minerals. PGM are associated with copper sulphide ores. The used methods allow the detection of low temperature platinum group minerals (hydroxide etc.). These minerals are observed during the pyrite degradation process. In the selected samples, low temperature dendrite morphology PGM developed after pyrite-marcasite crystals are characteristic.

Several conclusion are drawn:

- Pyrite-copper sulphide mineralization located in volcanic rocks of ophiolite formation contains Platinum group minerals.
- PGM are related to three metasomatic-hydrothermal and hydrothermal stages: 1. The early stage of medium degree temperatures is characterized by PGM mobilization due to the hydrotherms derived by plutonic sequences. Tipomorphic minerals are isoferroplatinum, sperylite, and cuprite etc., 2. Medium-low temperature mineralization stage replaces and modify the first one. Such type minerals as Cu, Ni, Co sulphoarsenates of Pt, Ru, and Rh are the most typical. A new mineral phase Cu (Co, Pt) $_2$ S_6 is evidenced, 3. This stage corresponds to low temperature assemblages (oxides, hydroxides). They are formed during the modification of primary sulphide minerals.
- The last mineralization stage is linked to the decrease of sulphur fugacity and the increase of oxygen fugacity. The disintegration of sulphide facilitates the identification of micro disperse and colloidal PGM grains trapped within ore minerals or between their intergranular interstices.

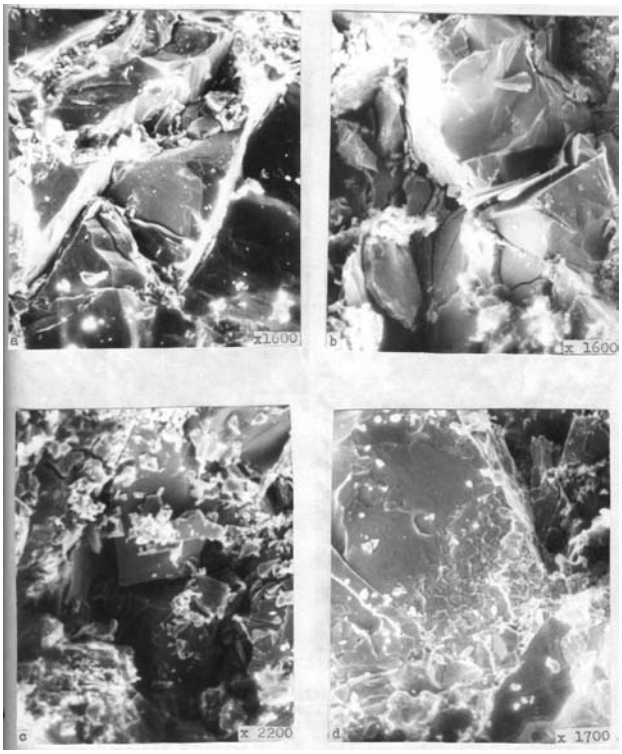

Figure 1. *Scanning electronic microscope microphoto of Perlati sulphide ore. a, b, c. Recrystallized pyrite crystals with microfissures. d.Pyrite cristals rimed by secondary pyrite.*

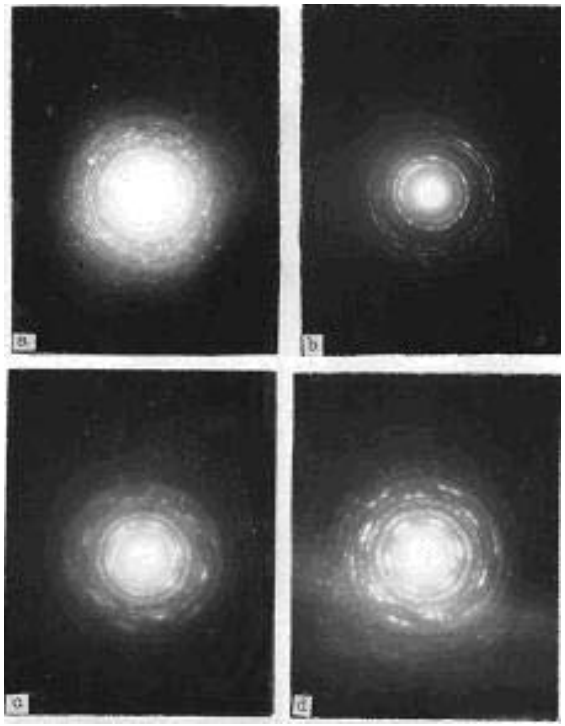

Figure 2. *Microdifraction picture of (Pt,Rh,Ru)(As,S)2 phase. a,b,c.- from fig.a to fig.d,in the component A is shown the platinum content changing white in the component B of AB2 phase is shown sulphur content changing.*

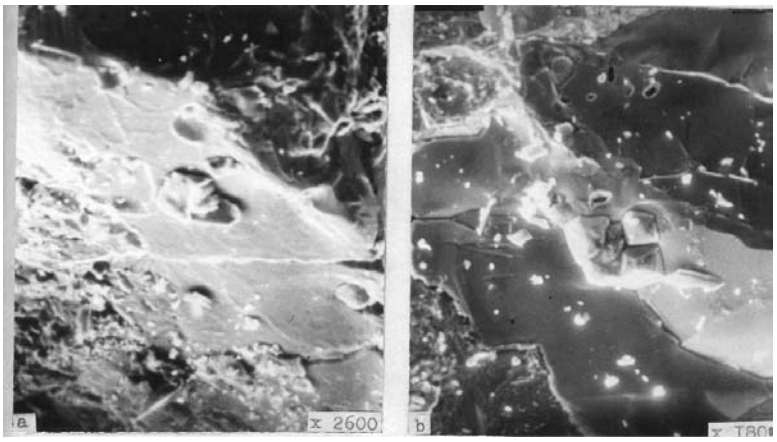

Figure 3. *Scanning electronic microscope microphoto of Perlati sulphide ore. a. Sulphide minerals modified by fluids.Re-deposition of Platinum crystals. b. Re-deposition of Platinum (in center) as octraedric morphology inclusions.*

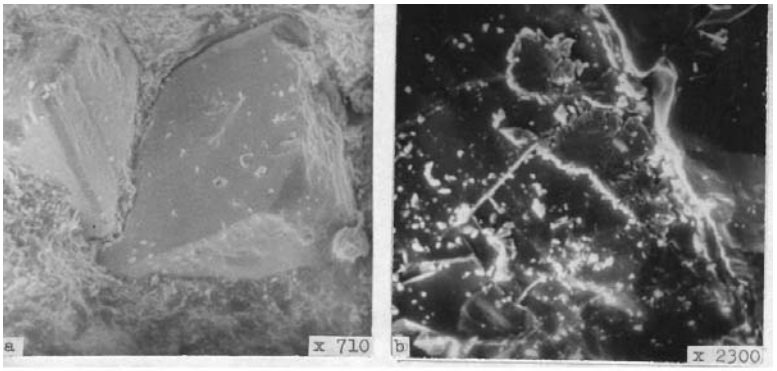

Figure 4. *Scanning electronic microscope microphoto of Perlati sulphide ore. a. Pyrite crystal. b.Dentrite shaped pyrite crystal.*

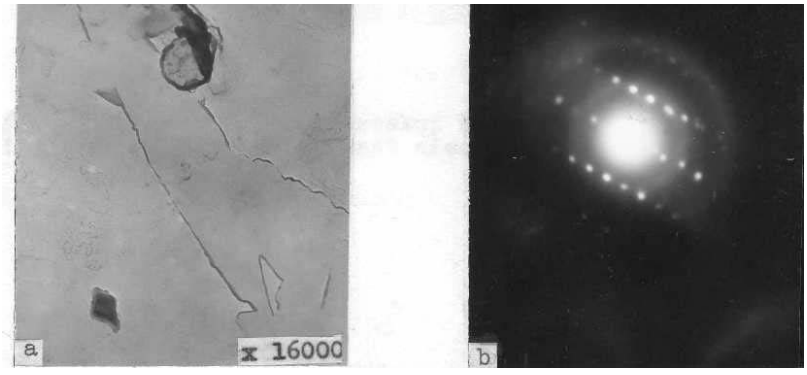

Figure 5. *Scanning electronic microscope microphoto of Perlati sulphide ore. a. Dentrite recrystallization of Platinum mineralization. b. Microdifraction picture indicating cubic syngony* $Cu(Co,Pt)_2 S_6$ *phase.*