THE GENESIS OF THE POLYMETALLIC MINERALIZATIONS FROM SCRIND-RACHITELE_POIANA HOREA REGION, VLADEASA MOUNTAINS

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Abstract: In the Somes series, metamorphosed polymetallic mineralizations (Zn-Pb-Ag-Au; Fe; Cu-Au), as stratiform massive and disseminated ores and hydrothwermal veins, are related to the Precambrian rhyolitic volcanism. In hercinian and alpine orogenies, hydrothermal sulfide mineralization was formed by complex remobilizations from Precambrian onesIn laramide metallogenesis sulfide and native Au veinlets were formed.at the boundary of the Somes metamorphics and Vladeasa ignimbrite rhyolites.

Key words:precambrian stratiform,hydrothermal sulfides, late remobilizations

The polymetallic mineralizations from Scrind-Rachitele-Poiana Horea, known since XVII century, were researched more detailed, by mining works, in 1973-1980 period.They are the most important in Somes series, both economic and genetically.

Genetic considerations in this paper are the result of our geological revisions in 1976-1981.(M.Panaite, Ioana Panaite, unpublished data).

Somes series, Precambrian superior in age , formed in a metamophism process of barrovian type, is made up by micaschists, quartzites, paragneises, felsic metauff, metarhyolites, amphybolites and rare cristaline limestones. In medium part, that is in leptino-amphybolite formation, metamorphosed syngenetic mineralizations (Zn-Pb-Ag-Ag-Au; Fe; Cu-Au) are developed (Alunis valley, Gingineasa, Lupoaia valley, Gorunetului brook).

The Somes metamorphics have undergone highly retrograde metamorphism in hercinian and alpine orogenies,.when remobilizations processes within precambrian mineralizations took place.

Lenticular, concordant and stratiform development of the polymetallic massive ores, metamorphosed sulfide veins and hydrothermal remobilized mineralizations were recognized by the authors since 1972 (Panaite et al.,1973).

Gheorghitescu et al.(1980) considered polymetallic ore as syngenetic, concordant in Somes metamorphics and genetically associated to hercinian mafic volcanics.

In Marza opinion (1982) mineralizations from Scrind-Rachitele are of metamorphosed volcano-sedimentary type, generated in ireland arch stage.

I. The syngenetic, metamorphosed volcano-sedimentary mineralizations are of three types, from botom to top of the lithostratigraphic sequence::

-massive, complex (Zn-Pb-Ag-Au), made up of pyrite (25-30%), arsenopyrite (7-10%), pyrrhotite, sphalerite, galena, chalcopyrite, freibergite, siderite, quartz and muscovite, developed as strata bound in upper part of felsic metatuffs (Alunis valley, Lupoaia valley, Belis valley);

-metamorphosed iron banded ore (magnetite, siderite) Gingineasa valley, Gorunetului brook ;

-massive pyrite-copper ore, consisting of pyrite, chalcopyrite, arsenopyrite, pyrrhotite, quartz and muscovite, located in micaschists, highly retromorphosed (Gingineasa valley, Negru brook).

The first type is equivalent with Burloaia I zone ore and Lesu Ursukui II zone ore.

The pyrite- copper massive ore is equivalent with Burloaia marginal facies (East Carpathians) Both, complex ore and massive pytite-copper ores pass in laterally zones to disseminated type, where only pyrite and arsenopyrite are present. (Belis valley, Lupoaia valley).

They are characterized by inechigranular structure, resulting from pyrite and arsenopyrite porphyroblasts development, up to 10 mm in size , in a microblastic sulfide groundmass.

The texture varies from the massive one to banded, the last derived from diferent granulations of the bands.

Over the massive polymetallic ore from Alunis valley disseminated arsenopyrite occurs, as large porphyroblasts, up to 12 mm., but idiomorphic ones, sometimes twined.. Brittle deformation is common in pyrite and arsenopyrite and galena, sphalerite , pyrrhotite, siderite assemblage occurs as infilling in the hard sulfides.

Usually, the sphalerite contains chalcopyrite and pyrrhotite incoherent exsolutions.

Galena occurs sometimes as nests and small veins of some cm. in size.. In the larger nests galena contains freibergite exsolutions .

Gold is likely included as solid solution in the crystal lattice of arsenopyrite and chalcopyrite. Ag|Au ratio is of 150 up to 200.

The concordant massive polymetallic ore, is crosscut by synmetamorphic veinlets consisting of pyrite, arsenopyrite, galena and siderite in Alunis valley..The massive pyrite- copper ore is developed as concordant bands which unifay into one lens on the strike, like in Gingineasa and Negru brook mining works.

In the massive pyrite-copper ores (Gingineasa, Negru brook) which consist mainly of pyrite and arsenopyrite, the pyrrhotite grains contain pyrite remnants, like in metamorphosed hydrothermal veins, which is a prove of synmetamorphic forming of pyrrhotite from conversion of pyrite during the mediun to high assyntic metamorphism. (Kulerud, Yoder, 1959)

The two varieties, hexagonal and monoclinic pyrrhotite (determined by x-ray analyses and cromic acid tests) are intergrown, and this feature indicates a higher temperature than 300 degrees in the last evolution stage. (Yund, Hall,1969)

In Gingineasa mining works, the massive lens ore is underlain by strata bound iron ore up to 1 meter in thickness, which consists almost only magnetite and siderite. The oxide sometimes contains siderite nucleus, or is present as fine grains on the siderite cleavage, indicating its forming from siderite in the low ratio O2/CO2 conditions. (Shunzo Yui,l966). A massive magnetite-siderite lens occurs in the Golumbat brook.

The banded iron and pyrite –copper syngenetic ores are concordant at outcrop scale and micaschists hosts are marked by crenulation cleavage, but in respect with Gingineasa –Plaiului anticline , the mineralized horizon is discordant.

The massive polymetallic syngenetic mineralization situated in upper part of felsic metatuffs was precipitated near the hydroterms and the pyrite-copper ore was deposited later and at a larger distance in respect with the hydrothermal solutions source.

The volcanic phase was of bimodal character, one rhyolitic and another represented by basic rock, because the felsic metatuffs are overlain by micaschists with amphybolite lenses in all mineralized sequences, like in East Carpathians (Krautner, 1987)

2. Only in the area of syngenetic massive polymetallic ore are metamorphosed hygrothermal veins, rich especially in siderite and subordinate pyrite, arsenopyrite, chalcopyrite, pyrrhotite and quartz, highly brecciated as the footwall and hangingwall

metamorphics. The best outcrops are in Alunis valley, Popii brook, Mihut brook, Belis valley and Dobrani brook, The large porphyroblasts of siderite are cemented by pyrite, pyrrhotite, chalcopyrite and fine grained siderite.

The veins were formed in the same time with the stratiform polymetallic ore, on the fractures, near the hydroterms.

3.The precambrian mezometamomorphics and syngenetic interlaid mineralizations were highly affected by hercinian and alpine deformations movements.

They caused minor remobilizations of galena, sphalerite, pyrrhotite, chalcopyrite and siderite on the „ac" fisures and in folds axes, but and complex remobilizations, like sphalerite and pyrrhotite veins and small mineralized column.

In Alunis valley, near the massive stratiform polymetallic ore is a breccia column consisting of felsic metatuffs and micaschists blocks, highly affected by chloritization and mineralized with sulfide, which succeded to a small laramic diorite intrusion.. The ore is made up of a groundmass of sphalerite and pyrrhotite, of pink colour, where are hemieuhedral pyrite and arsenopyrite cristals and small nests of galena with tetrahedrite and chalcopyrite exolutions.

The mineralized breccia column is twice up to four times richer in Zn and Pb and tens times poorer in Ag and Au than massive polymetallic ore.

The sphalerite and pyrrhotite became ductile at about 250 degrees and 100 bars (Kelly, Clark, 1975), but the presence of pyrite and arsenopyrite, as euhedral and hemieuhedral cristals, without brittle deformation , is a prove of deposition from the complex hydrothermal solutions generated by deformation movements of laramide tectonic phase.

In Gingineasa mining work, in the footwall of pyrite –copper lens ore , on a paralel fracture is a vein, which consist predominantly from sphalerite and rare nests of galena, chalcopirite, siderite and calcite and corroded blocks of iron ore. The sphalerite , of pink colour, contains 7,09-7,17 Fe, 0,23-0,28 Mn and 0,17-0,20 Cd. In Gorunetului brook, the iron ore lens is crosscut by galena veins., also as remobilizations. In Stanciului valley and Agastau valley retromorphosed micaschists are crosscut by veinlets of arsenopyrite, on ac fisures.

4. In the northern side of the region, at the boundary with Vladeasa ignimbrites area, small veins of pyrite, marcasite (sometimes as epitaxial intergrown), galena, sphalerite , chalcopyrite, quartz and opal outcrop. (Panaite, 1977) In some analysed ore samples are Ni (30-100 p.p.m.), Co (3-15 p.p.m.) and As (300-600 p.p.m.) Au|Ag ratio is about 1:3. It is a sulfide –native Au low temperature mineralization associated to laramide metallogenesis, single of this type, known so far in the region, whose presence indicates a posible role in the remobilization of the Precambrian metamorphosed syngenetic stratiform sulfide mineralizations

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