PROJECTS FOR THE EXTRACTION OF PYRITE IN ALBANIA AND KOSOVO

KASTRATI, S.*, GRIECO, G. & PEDROTTI, M.
Dipartimento di Scienze della Terra "A. Desio", Università degli Studi di Milano, Via Botticelli, 23, Milano, Italy
* E-mail: shpetim.kastrati@unimi.it

Pyrite (FeS_2) is an iron sulfide and one of the most ubiquitous minerals of earth crust. It is found in igneous, metamorphic and sedimentary rocks and crystallizes at both high and low temperatures.

Pyrite was widely used in the past for the production of sulfuric acid, but due to environmental pollution nowadays this use is limited to China and pyrite lost its value as an industrial mineral. In the last decade anyway new industrial applications of pyrite have opened new markets for this mineral. Such applications comprise: stainless steel production (60% of total pyrite market), abrasives (15%), dyes, pigments for glass (20%), brakes (3%), rechargeable batteries (2%). These new applications need small amounts of pyrite but require very demanding quality parameters.

The present work deals with projects for the extraction of pyrite in Albania and Kosovo for these new industrial applications.

For the projects three different ways to recover pyrite were considered: a) as a by-product of pyrite-bearing active mines (Trepça, Kosovo; Fusharrez, Albania); b) re-opening of abandoned pyrite mines used in past for sulfuric acid production (Spaç, Albania); c) exploitation of a new pyrite deposit (Lunik, Albania).

Pyrite is an important sulfide phase in the active lead and zinc Trepça Mine, Kosovo. Trepça Belt belongs to the Kosovo sector of the Serbo-Kosovo-Macedonian-Rhodope Metallogenic belt of Oligocene-Miocene age, which includes base and precious-metal districts in Kosovo, southern and western Serbia, variscan structures marginal to the Serbo-Kosovo-Macedonia, northern Greece and southern Bulgaria (HEINRICH & NEUBAUER, 2002). At Stanterg (Trepça mine), massive sulfide ore of economic importance forms continuous, columnar shaped ore bodies of carbonate replacement type (skarn) related to the emplacement of tertiary magmas (granodiorite and dacite-andesite). These are located along the carbonate-schist contact and dip parallel to the plunge of the anticline. The ore bodies extend along a strike length of 1200 m, and have been explored to a depth of 925 m below the surface (11 levels). Pyrite can be also recovered from tailing dumps.

In northern Albania, pyrite can be recovered within the Mirdita ophiolite belt, in similar geological settings, as a by-product and from the tailings of the copper Fusharrez mine and from the abandoned pyrite Spaç mine.

Mirdita is located in the Jurassic age Mirdita-Pindos ophiolite belt of Albania-Greece that ranges from ultramafic to mafic rocks with a number of andesitic and felsic volcanic domes in the central portion. The volcanic rocks are overlain by a sedimentary melange (BECCALUVA *et al*., 1994).

Finally, in eastern Albania the never exploited pyrite Lunik deposit is placed inside volcanic rocks. It was formed under water together with pillow basalts and at low temperature hydrothermal conditions.

Basalt rocks of Lunik are placed over gabbro through gabbrodiabase or over the ultramafic sequence of the western ophiolites through ocean metamorphics (metabasalt), and covered normally by the Upper-Middle Jurassic siliceous radiolarite, or transgressively by heterogeneous ophiolitic melange of Upper Jurassic (Tithonian). Volcanites of this series in many sectors underwent low grade metamorphism from zeolite to greenschist facies and were affected by low temperature hydrothermal alteration that was responsible for the precipitation of pyrite.

The demanding quality parameters for the new industrial applications concern grain size (90% between 10-50 mm), S content (48 ± 2 wt%) and Fe (above 44 wt%). These conditions are satisfied at Fusharrez, Spaç, and Trepça rock pyrite, while at Lunik are not.

Flotated pyrite, due to its fine grain size (< 0.075 mm), can be used only for the glass industry. Trepça tailings do not satisfy chemical quality parameters, while at Fusharrez tailings reach the values for glass industry.

References

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