

Polymetallic Ores Hydroprocessing at Cobre Las Cruces. Flotation Pilot Plant Outcomes.

Carlos Frias, Jorge Blanco, Edward Vera, Natalia Moreno, Francisco Sanchez

COBRE LAS CRUCES, S.A. – www.cobrelascruces.com – carlos.frias@fqml.com

ABSTRACT

Conventional technology to deal with polymetallic ores in the Iberian Pyrite Belt mining region, located in the South of Spain and Portugal, is based on selective flotation process aiming to produce separate concentrates of copper, zinc and lead. Due to complex mineralogy of those polymetallic ores is difficult to achieve qualified commercial concentrates, which also contain some detrimental impurities (e.g. Hg, As, Sb, Bi) that are penalized in smelting contracts.

Along last two years, Cobre Las Cruces (CLC) is developing a new technological approach to deal efficiently with polymetallic ores based on a suitable combination of bulk flotation and hydrometallurgy aiming to recover in situ the four valuable metals (Cu, Zn, Pb and Ag). The objective is to produce high-quality copper and zinc cathodes together with lead and silver by-products. The new hydrometallurgical technology will improve substantially the resource efficiency and will provide a more robust and sustainable mining-metallurgical business.

After covering successfully the laboratory test works, yielding metals extraction over 95%, CLC has implemented a Pilot Plant facility having a capacity of one tonne per hour of polymetallic ores to produce a bulk concentrate (12-15% Cu+Zn+Pb) by flotation, which is further treated in two sequential stages: (1) ferric atmospheric leaching to release copper and zinc in solution, and (2) hot brine leaching of residual solid to recover lead and silver by-products.

Ferric atmospheric leaching is based on SICAL technology (Silver Catalysed Atmospheric Leach-ing) developed by CLC and integrated with specific mechanical activation of the bulk concentrate. A special care will be paid to avoid lead and silver jarosite formation in leaching process.

The Pilot Plant will be running in continuous mode during several months aiming to achieve design parameters and technical information to undertake finally a feasibility study of the future commercial plant.

This paper refers to the outcomes of Pilot Plant after several months continuous operation and focused on milling and flotation process performance and efficiency.