IMPROVED PROCESS FOR CHALCOPYRITE LEACHING

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ABSTRACT

Approximately 70% of the world's copper reserves are contained in the mineral chalcopyrite. Currently, copper is extracted from high-grade chalcopyrite through smelting, a high temperature process with undesirable environmental side effects. Among the alternatives to smelting, bacterial attack is very slow and is cost-effective only for low-grade minerals; and aqueous phase oxidative leaching techniques suffer from problems with sulfur passivation from the chalcopyrite itself. Earlier attempts to develop reductive leaching have not been commercially successful: the resulting processes are not economical, and they produce toxic by-products.

Researchers at Universidad Autonoma Metropolitana and the University of California, Berkeley have developed an improved process for the reductive leaching of chalcopyrite. Standard procedures for chalcopyrite leaching use as the reducing agent metals or hydrogen introduced from an external source; the innovation that is key to the improved UAM-Berkeley process is in-situ generation of nascent, or monatomic, hydrogen, a stronger reducing agent, which does not introduce additional metal ions into the system. As a result, the UAM-Berkeley process can be carried out at near ambient temperatures and pressures, and without the production of toxic gases.

APPLICATIONS

Processing of high-grade chalcopyrite ores

Processing of ores containing Mn, Ni and refractory silver and gold

ADVANTAGES

Does not require elevated temperature/pressure

No toxic gases produced

As a pretreatment, can improve the efficiency of oxidative leaching processes

PATENT STATUS

Patent Pending

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OTHER INFORMATION

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