

METAL SOLUTION MINING - AN OVERVIEW

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Solution mining of metals from minerals is being practiced in the form of heap and dump leaching of copper and gold containing ores. Uranium is being leached in some underground mines using the same principles, or by injection and production well arrays in placers. Usually, the metal concentration in the leached ores is a few percent, in the case of gold a few grammes only per ton of ore. Accordingly, the metal concentrations in the leach solutions are very small, e.g. 2 g Cu/l. However, efficient recovery of metals from pregnant solutions by modern solvent extraction/ electrowinning methods or gold adsorption to carbon makes solution mining economical even for very low grade ores. This is in sharp contrast to the concentration levels applied in salt solution mining.

The chemistry of ore leaching obeys the same kinetic laws applicable to salt dissolution. However, the transportation mechanism in a brine producing cavity is not comparable with the percolation of solution through a porous pile of ore in metals solution mining.

Hypothetically it is suggested that high grade metal leaching in deep deposits would exhibit solution mining characteristics comparable with salt leaching.

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