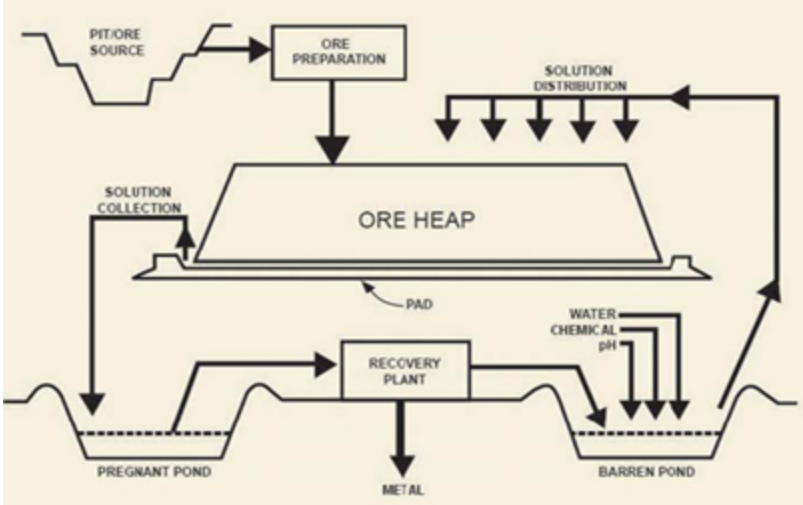
METALLURGICAL LEACHING

Metallurgical leaching is a mining technology that involves the treatment of mineralmaterials, mainly oxidized containing desirable metals and which are reduced in size to be subjected to a wet process with acidic or basic solutions to dissolve soluble elements and concentrate in an enriched solution, so it is considered a “hydrometallurgical” process.

This process allows to work “mineral deposits” ranked as low concentration provided that the mining operation occurs to a large scale to reduce costs per ton of mineral extraction and ensure profitability in the process.

Compared to pyrometallurgical operations, leaching is a much simpler and much less harmful because gaseous pollution never occurs, and because its energy consumption is very low, mostly depending on gravity's action and pumping solutions to the heap.

The control points in the leaching process are to monitor the potential of acid generation of waste rocks to avoid toxicity, the efficiency of the operation and the temperature of the reactions are essential to ensure the profitability of the chemical operation of the reactants.



There are various kinds of Metallurgical leaching processes. To choose the most appropriate will generally depend on the type of “reagents” used for the operation, which are selected according to the type of mineral or material being processed and that will generally can be identified as “oxides “or” sulfide”

In the case of the leaching of a zinc oxide, a simple leaching reaction can be illustrated in the following formula: ZnO (zinc oxide) + H2SO4 (sulfuric acid) -> ZnSO4 (soluble zinc sulphate) + H20 (water)

In the case of aluminum oxide, the leaching can occur with “alkali” solutions, for example, under the following formula:

Al2O2 (1 molecule of aluminum oxide) + 3H2O (3 molecules of water) + 2NaOH (2 molecules hydroxide sodium) -> 2NaAl (OH) 4 (hydrated sodium aluminate)

The leaching of precious metals like gold and silver can be done very easily with cyanide or ozone under ambient conditions.

Sulfide leaching is a more complex process because of the refractory nature of the sulphide minerals. Pressure chambers can be used, for example, in the zinc metallurgy in the following reaction:

2ZnS + O2 + 2H2SO4 -> + 2H2O + 2S 2ZnSO4 that occurs at temperatures above the boiling point of water, creating a vapor pressure within the pressure chamber at pressures of about 0.6 MPa .

Source : http://www.artinaid.com/2013/04/what-is-metallurgical-leaching/