

Role of Micro-organisms and Their Significance in Treatment of Minerals and Industrial Wastes for Metal Recovery

L. B. Sukla

Abstract

Removal of toxic or economic extraction of important heavy metals from mine and industrial waste materials are of great importance both from environmental and industrial viewpoints. These wastes are the carriers of valuable metals i.e base metals, precious and platinum group metals (e.g. electronic waste, spent catalysts) or rare earth elements. Common practices of waste management in these industries are either through recycling and recovering the metal values or by dumping. Microorganisms involved in the leaching process have a number of characteristics in common that make them suitable for mineral and metal solubilisation. These microorganisms act as catalysts to promote and enhance the dissolution rates of respective metals from ores and wastes. Bioleaching offers several advantages to process the low and run-off mine ores and wastes. These processes are considered to be eco-friendly and provide economic technology. The most preferred methodology for recovery of metal values from low-grade ores through bioleaching is the heap bioleaching technology that offers several advantages. Furthermore, heap bioleaching coupled with hydrometallurgical methods of metal recovery such as those of the solvent extraction (SX) and electro-winning (EW) are gaining importance in recent years.

Keywords : Biomineral Processing, Heap Bioleaching, Bioreduction–Bioleaching, Bioreduction–Chemical Leaching , eco-friendly, lean ores, e-wastes.