Selective Bioleaching of Valuable Metals

Heterotrophic organisms can produce bio-molecules in a green way to interact with target metals in substrate:\[2\]
- Organic acids act through their dual role as proton donor in acetylation and ligand for metal complexation,
- Inorganic salts to extract metallic nodes (Figure 1),
- Siderophores or large complexes found in nature to transport metal cations in solution,
- Bio-surfactants to dissolve metals in micelles.

Electrochemical Recovery Systems

Electricity-driven separation processes form a highly compatible last step in hydrometallurgical recycling. It allows coupling with bioleaching in a continuous mode of operation.\[2\]

Concentration of the target metal is achieved by electro-dialysis (Figure 3) with selective ion-exchange membranes or through direct electro-deposition at the cathode. At the anode, negatively charged lixiviant is collected for re-use during consecutive leaching steps. Recirculation of the leachate guarantees near 100% complete separation (Figure 4) against high current efficiencies.

References


Contact

Ghent University
Faculty of Bioscience Engineering
Corrugate Links 603
9000 Gent
E-mail: karel.folens@ugent.be
Telephone: 09/264.59.78