

***Acidithiobacillus caldus*, *Leptospirillum* spp., *Ferroplasma* spp. and *Sulphobacillus* spp. mixed strains for use in cobalt and copper removal from water**

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Abstract

Bacteria from the genus *Acidithiobacillus*, *Leptospirillum* and *Ferroplasma*, *Sulphobacillus* are often associated with water remediation. In this study a consortium of *Acidithiobacillus caldus*, *Leptospirillum* spp., *Ferroplasma* spp. and *Sulphobacillus* spp. was cultured and used to remove Cu^{2+} and Co^{2+} from synthetic aqueous sulphate solutions. The influence of experimental conditions such as pH, temperature, time, volume and metal concentration on the efficiency of the biosorption process was investigated. Biosorption of 54 to 67% Cu (pH 2, 37°C, 24 h) and 23-70% Co (pH 2, 37°C, 24 h) was observed from solutions containing $3.86 \text{ g}\cdot\text{l}^{-1} \text{ Cu}^{2+}$ ions and $3.36 \text{ g}\cdot\text{l}^{-1} \text{ Co}^{2+}$ ions. Such findings suggest that if optimal conditions for biosorption of the metals by micro-organisms are achieved, this should afford a cost-effective method of removing metal species from water and aqueous solutions.

Keywords: copper, cobalt, adsorption, biosorption, synthetic solution