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The Use of Microorganisms in the Bioleaching of Soils Polluted with Heavy Metals

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Abstract : This paper shows researches in order to extract Cr, Cu and Ni from the polluted soils. Research is based on preliminary studies regarding the usage of Thiobacillus ferrooxidans bacterium (9K medium) for bioleaching of soil polluted with heavy metal (Cu, Cr and Ni). The microorganisms (Thiobacillus ferooxidans) selected directly from polluted soil samples were used in this experimental work. Soil samples used in the experimental research were taken from an area polluted with heavy metals from Romania. The soil samples are subjected to the cleaning process using the 9K medium solution (20 mL and 40 mL, respectively), stirred 200 rpm for 20 hours at a controlled temperature (30 ˚C). During the experiment (0, 2, 4, 8 and 20 h), liquid samples have been extracted and analyzed using the Atomic Absorption Spectrophotometer AA-6800 (AAS) in order to determine the Cr, Cu and Ni concentration. Experiments led to the conclusion that these soils can be depolluted by bioleaching, being a biological treatment method involving the use of microorganisms to favor the extraction of Cr, Cu and Ni from polluted soils.

Keywords : bioleaching, extraction, microorganisms, soil, polluted, Thiobacillus ferooxidans
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