

The application of acetylacetone for the separation of heavy metals in roadside soil belts by extraction methods

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ABSTRACT

The content of heavy metals in the vicinity of roads with high traffic intensity was determined. The possibility of recovery and separation of these metals from sulfate model solutions was also investigated using three methods: liquid–liquid system solvent extraction, transport through polymer inclusion membranes and by measuring sorption on polymeric sorbents based on polyvinyl chloride. Acetylacetone was the active substance in all processes. The parameters characteristic for these separation processes were determined. Excessive amounts of Zn, Cu, Cr, and Ni were found in soil samples. Even though all applied methods of metal separation are comparably effective, the sorption process is the cheapest. With sorption at pH = 7.8, the reduction of Zn, Cu, Cr, and Ni concentrations was 91%, 99%, 43%, and 11%, respectively, and the Zn/M separation coefficients for Cu, Cr and Ni were 1.15, 2.60 and 8.72, respectively.

Keywords: Heavy metals removal; Soil; Solvent extraction; PIM; Sorption

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