IMMOBILISED HUMIC SUBSTANCES FOR REMOVAL OF POLLUTANTS FROM WASTEWATERS

Linda Ansone-Bertina
Karina Upska
Linda Dobkevica
Maris Klavins
University of Latvia, Latvia

Abstract

The environmental pollution with the emerging contaminants is a worldwide problem, that nowadays is receiving increasingly more attention. However, although the release of these substances in the aquatic environment has been occurring for a long time, wastewater treatment plants still are not able to entirely remove contaminants, therefore trace metals, metalloids and pharmaceuticals are often found in environmental samples. Humic substances as refractory part of natural organic matter nowadays are produced at industrial scale and they can be obtained also from waste materials, such as compost etc. Humic substances as polyfunctional materials are able to strongly interact both with organic as well as inorganic substances. Given that, such environmentally friendly and cost-effective sorbents like humic substances could be used if their sorption properties could be increased by immobilization. We have elaborated several methods to develop low-cost humic based sorbents with high sorption capacity, well developed surface area. To our knowledge up to now immobilized humic substance sorbents are not widely studied as sorbents.. The characterization methods (SEM, TGA, BET, element content) of immobilized humic substances indicates that the immobilization has been successful. The obtained humic based sorbents demonstrates high sorption capacity in respect to metal ions (Cr(III), Cu(II), and others as well as pharmaceuticals (chloropromazine).

Keywords: Humic Substances, Immobilization, Emerging Contaminants, Chromium, Arsenic, Pharmaceuticals