Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

VISCOSE-MAGHEMITE/GOETHITE POLYMERIC COMPOSITE AS SORBENT FOR OIL SPILL CLEANUP

Razvan Rotaru, Maria Emiliana Fortuna*, Corneliu Cojocaru, Petrisor Samoila, Lucia Pricop, Valeria Harabagiu

"Petru Poni" Institute of Macromolecular Chemistry, 41A Gr. Ghica Voda Alley, Iasi, 700487, Romania

Abstract

The paper reports on the preparation of polysiloxane hydrophobized viscose-maghemite/goethite magnetic composite with properties appropriate for uses in oil spill sorption from polluted aqueous media. A multi-step procedure was employed to obtain the polymeric composite. The structures of the prepared samples and precursors were analyzed by Fourier transform infrared spectroscopy (FTIR), whereas their morphology was investigated by means of scanning electron microscopy (SEM). The hydrophobicity of the composite was confirmed by the water-contact-angle value of 93 degrees. The magnetic properties of the composite were evaluated showing a saturation magnetization (MS) equal to 26.7 emu/g. The developed composite material unveiled relevant sorption capacities of 15-17 g/g for liquid hydrocarbons (decane/dodecane) and 35-37 g/g for motor oils uptake. The obtained results showed that the employed synthesis method led to a composite material with good magnetic and sorption properties, which can be applied as a potential oil spill sorbent in aquatic media.

Key words: ferromagnetic, oil spill, polymeric composite

Received: October, 2016; Revised final: March, 2017; Accepted: June, 2017

*Author to whom all correspondence should be addressed: e-mail: fortuna.maria@icmpp.ro; Phone: +40735511119