

Preparation and application of a magnetic composite sorbent for collecting oil from a water surface

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Abstract

© 2006-2016 Asian Research Publishing Network (ARPN). All rights reserved. Oil products are among the most dangerous pollution of water objects. They have a deleterious effect on the physiological and biochemical processes in the body of biological objects. In recent years, more and more attention is paid using of industrial waste for water treatment from oil products. In this study, the composite magnetic sorption material was received by chemical sedimentation using of the waste of MDF production (wood fiber) and iron chloride (II) and (III). Fractional composition and physico-chemical characteristics (Tamped density, content of moisture, ash content, buoyancy, specific surface area) of the reagent was detected, the micrographs were obtained by scanning electron microscope. The elemental composition of materials was identified using the method of energy-dispersive X-ray spectroscopy. The remanent magnetism and the coercive force of the samples of modified wood fiber were calculated According of obtained hysteresis loops. IR spectra of the sorption materials were obtained and described using the method of FTIR spectroscopy in a frequency range of 400-4000 cm^{-1} . Oil sorption capacity and water uptake of waste wood fiber and magnetic composite sorbent were evaluated in static system. Increase of oil sorption capacity and decrease of water uptake after modification of waste wood fiber was observed. Experiments to remove oil pollution from the water surface were carried out. The effectiveness of the proposed sorption material was discussed.

Keywords

Magnetite, Oil, Sorption material, Waste, Wood fibers

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