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MWCNTs Based nanocomposites for hydrocarbons and MB removal from water

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With the rise in the global population, demand for energy resources has been increased. The transportation of fossil fuels especially petroleum oil is a big challenge. The need to reduce the shipping time for petroleum oil causes oil spills which is a major contributor to seawater pollution. A cheap, effective, and environmentally friendly method needed to be adopted for cleansing the seawater. In recent research work, polymers base magnetite multi-walled carbon nanotube(Fe/MWCNTs) are applied for the adsorption of kerosene and toluene from water. Oxidized MWCNTs were incorporated with magnetite and Fe/MWCNTs were prepared. A Physio-sonication method was used for the preparation of final nanocomposites. Two polymers; polyethylene (PE) and poly-N-isopropyl acrylamide-co-butyl acrylate (P-NIPAM) were added to Fe/MWCNTs and final nanocomposite, PE: Fe/MWCNTs, and P-NIPAM: Fe/MWCNTs were obtained. The oxidized and modified MWCNTs were characterized using X-Ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), energy dispersive X-Ray (EDX), fourier transform infrared (FTIR), and (BET). The adsorption experiment for these polymers gave excellent results; PE: Fe/MWCNTs and P-NIPAM: Fe/MWCNTs achieved 3400 mg/g and more than 8000 mg/g removal capacity of kerosene from water, respectively. The polymer PS: Fe/MWCNTs achieved 760 mg/g removal capacity of toluene from water. The results proved that adding polymers to MWCNTs increased their efficiency for kerosene/ toluene removal from seawater. For comparison, other metal oxides base nanocomposites like V2O5/MWCNTs and CeO2/ MWCNTs were applied for kerosene removal from water and exhibited promising results for oil removal from water.

Biography

Thamer Adnan Abdullah completed his Master of Chemical Engineering from Guru Gobind Singh Indraprastha University, New Delhi. In 2008, he was working as an assistant lecturer at the University of Technology, Baghdad, in the Applied Science Department, Chemistry Branch Group. Currently, he is doing his Ph D. and he is a researcher in the Sustainability Solutions Research Lab, Faculty of Engineering, University of Pannonia, Veszprem, Hungary. He has several articles published in ScienceDirect reputed journals and has participated in many international conferences in the field of environmental chemistry and nano-research.

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