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Synthesis of MWCNTs/ThO₂ nanocomposite and its adsorption application for the removal of heavy metal from aqueous medium

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Multiwall carbon nanotubes (MWCNTs) were chemically modified to form nanocomposite with thorium oxide. The MWCNTs/ThO₂ nanocomposite was characterized using different modern techniques including Fourier transform infrared spectroscopy, X-ray powdered diffraction, scanning electron microscope, and transmission electron microscope. The average size of MWCNTs/ThO₂ nanocomposite was in the range from 5 to 10 nm. The nanocomposite material was investigated for its adsorption behavior for Pb(II) ions removal from its aqueous system. For the adsorption of Pb(II) by MWCNTs/ThO₂, the equilibrium was achieved within 50 min. The temperature and pH have also found to play important role in the adsorption process and maximum adsorption was found at 45°C and pH 5.5.

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