

MWCNTs-Fe₃O₄ nanocomposite for Hg(II) high adsorption efficiency

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ABSTRACT

Magnetic carbon nanotubes composite (MWCNTs-Fe₃O₄) was successfully prepared and characterized using different techniques. MWCNTs-Fe₃O₄ displays entangled network of oxidized MWCNTs attached with Fe₃O₄ clusters with specific surface area of 92 m² g⁻¹. The adsorption performance of as prepared composite was investigated for Hg(II) removal. Several experimental factors affecting Hg(II) adsorption process by MWCNTs-Fe₃O₄ were studied including, adsorbent dosage, contact time, pH and metal ion concentration. A high adsorption capacity of 238.78 mg g⁻¹ was obtained according to Langmuir model. In addition, pseudo-second-order and the Langmuir isotherm model were used to fit the adsorption kinetic and equilibrium data, respectively. The results recommend the successful application of MWCNTs-Fe₃O₄ for Hg(II) removal via batch adsorption technique

KEYWORDS: Carbon nanotubes; Nanocomposite; Water treatment; Adsorption; Hg(II) removal; Pollutants

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