

Removal of Chromium (VI) from Contaminated Synthetic Groundwater using Functionalized Carbon Nanomaterials modified with Zinc and Potassium

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Abstract : Chromium has been discovered as a significant contributor to water pollution that causes cancer. Modified carbon nanotubes' (CNTs) potential as an adsorbent hasn't been thoroughly investigated. The study aimed at investigating the potentials of various functionalized carbon nanomaterials for Cr (VI) removal from contaminated synthetic groundwater. Functionalized carbon nanomaterials with layered and tube-like structures were designed based on thermal (KOH-activated micrographite sheets) and impregnation methods by anchoring K and Zn on carbon nanotubes (CNTs), respectively for the removal of Cr (VI) from contaminated synthetic groundwater. Zinc acetate modified carbon nanotubes (Zn-CNTs) and potassium hydroxide modified carbon nanotubes (K-CNTs) exhibited greater adsorption capacity for the Cr (VI) adsorbate compared to KOH-activated graphite (AC-1 and AC-0). Maximum removal efficiency for both adsorbents occurred at pH 2. Omu Aran Hand dug wells can therefore be treated with K-CNTs, since the experimental outcomes showed that CNTs adsorbent could operate well in a range of the experimental scenarios.

Keywords : carbon nanotubes, Chromium (VI), adsorption, water treatment, graphitic carbon, kinetics

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