EDTA- and amine-functionalized graphene oxide as sorbents for Ni(II) removal

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ABSTRACT

The adsorption behavior of Ni(II) onto graphene oxide (GO) derivatives N-(trimethoxysilylpropyl) ethylenediaminetriacetic acid-modified GO (EDTA-GO) and 3-Tri-methoxysilylpropyl-diethylene triamine (amine–silane)-modified GO (amine-GO) were investigated. The EDTA and amine groups significantly enhanced the Ni(II) adsorption capacity of GO. The experimental results illustrated that GO-based sorbents could selectively remove Ni(II) from contaminated water with a maximum adsorption capacity of 103 mg/g within 30–45 min. The influence of pH on the adsorption/desorption properties as well as reusability of the modified GO derivatives was also investigated. These results demonstrate the application of modified GO as an effective adsorbent for water protection.

Keywords: Graphene oxide; Adsorption; Nickel