

Removal of Arsenite by Iron Oxide Impregnated Granular Activated Carbon: Effects of Anions and Humic Acid

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Batch experiments were carried out to evaluate the effects of the anions (sulfate, carbonate, nitrate, chloride) and humic acid competition on arsenite (As(III)) removal by iron oxide impregnated granular activated carbon (IO/GAC) in aqueous solution. The characterization of IO/GAC adsorbent was investigated by scanning electron microscopy (SEM), X-ray diffraction (XRD), X-ray photoelectron spectroscopy (XPS), Brunauer-Emmett-Teller (BET) analysis. 10ppm of arsenite solution was removed more than 99% during one hour. Sulfate, carbonate, nitrate and chloride caused slight inhibition to arsenite removal. In addition, IO/GAC was reduced in the presence of HA 5ppm, 10ppm, 20ppm, from 94% to 85%, 76%, respectively. Therefore, the results suggest that IO/GAC is an effective permeable reactive barrier medium for treating highly-arsenite-contaminated water sources of mixed inorganic contaminants.