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Arsenic adsorption by iron-aluminium hydroxide coated onto macroporous supports: Insights from X-ray absorption spectroscopy and comparison with granular ferric hydroxides

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Highlights

- As(III) and As(V) adsorption by macroporous adsorbent composite was investigated.
- The experimental maximum adsorption capacity was 82.3 and 49.6 mg/g adsorbent for As(III) and As(V) respectively.
- The role of iron and aluminium hydr(oxide) particles in adsorbing As was determined.
- The mechanism of adsorption was found to be via inner-sphere complexation.
- Column studies were performed and compared with a commercial adsorbent.

Abstract:

This paper evaluates the arsenic adsorption characteristics of a macroporous polymer coated with coprecipitated iron-aluminium hydroxides (MHCMP). The MHCMP adsorbent-composite fits best with a pseudo-second order model for As(III) and a pseudo-first order kinetic model for As(V). The MHCMP shows a maximum adsorption capacity of 82.3 and 49.6 mg As/g adsorbent

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