

## The adsorption of arsenic on magnetic iron oxide in aqueous solutions

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### ABSTRACT

Iron oxides are widely used as adsorbents to remove pollutants because of their excellent surface activities and resultant significant adsorption capabilities. In an effort to study the adsorption and desorption behavior of arsenic in aqueous solutions containing magnetism iron oxide (MIO), solid–liquid separations were conducted in the laboratory using synthetically-prepared solutions. Results indicate that arsenic can be easily adsorbed and the adsorption can be described using Langmuir and Freundlich equation. It was determined that the capability of MIO for arsenic adsorption depended primarily on the surface activity of the adsorbent, pH of the solution, and arsenic speciation. Optimization adsorption was found to occur between pH 6.0 and 9.4 for arsenic (III) and pH less than 5.0 for arsenic (V). Adsorbed arsenic (V) could be easily desorbed from using a 10% solution of sodium hydroxide whereas arsenic (III) was found to be recalcitrant.

*Keywords:* Arsenic; Adsorption isotherm; Influencing factors; MIO

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