



## Adsorption of boron on iron-oxide in aqueous solutions

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### ABSTRACT

The adsorption of boron on iron-oxide (FeO(OH)) has been investigated in aqueous solutions as a function of pH, ionic strength, temperature, boron concentration and amount of the adsorbent. Analysis of the experimental data indicates that boron adsorption on iron-oxide is based on the replacement of a water molecule by a boric acid molecule. Evaluation of the experimental data reveals that boron adsorption on iron-oxide is an exothermic process, which is not significantly affected by the ionic strength, indicating the formation of inner-sphere complexes. Furthermore, the maximum adsorption capacity of iron-oxide for boron has been determined using the Langmuir isotherm and is equal to 0.03 mol/kg. The conditional formation constant of the surface complexes under optimum conditions has been found to be  $\log\beta^* = 4.5$ , indicating the relative high affinity of iron-oxide for boron.

*Keywords:* Boron adsorption; Iron-oxide; Water solutions; Thermodynamic data; Surface complexes; Formation constant

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