Copper(II) Interactions with Kaolinite: Factors Controlling Adsorption

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Abstract: The adsorption of Cu^{2+} on kaolinite was studied at different ionic strengths following various treatments of the mineral surface in order to evaluate the conditions influencing adsorption. The data indicate a strong preference of the Na^{+} exchange form of kaolinite for Cu^{2+} but a weak affinity of the natural kaolinite for Cu^{2+}. Protons are generated by Cu^{2+} adsorption, a result of the exchange of surface protons, and possibly the enhancement of Cu^{2+} hydrolysis at the kaolinite surfaces. The exchange of Na^{+} by Cu^{2+} on the kaolinite is not described by the mass-action equation, but can be interpreted in terms of permanent charge sites on the surfaces when the additional factors of Na^{+}-H_3O^{+} exchange and blockage of sites by Al ions are considered.

Key Words: Adsorption • Copper • Exchange • Hydrolysis • Kaolinite

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