

Mechanisms of Cu(II) Sorption at Several Mineral/Water Interfaces: An EPR Study

Young-Hwan Cho, Sung-Pil Hyun and Pilsoo Hahn

*Korea Atomic Energy Research Institute, P.O. Box 105 Yusong, Daejeon 305-600, Korea
e-mail: yhcho@kaeri.re.kr*

Abstract

In most traditional sorption study in environmental conditions, experimental sorption data have been measured and interpreted by empirical ways such as partition coefficient and sorption isotherms. A mechanistic understanding of heavy metal interactions with various minerals (metal oxides, clay minerals) in aqueous medium is required to describe the behavior of radioactive metal ions in the environment. Various spectroscopic methods provide direct or indirect information on sorption mechanisms involved. We applied EPR (Electron Paramagnetic Resonance) spectroscopy to investigate the nature of metal ion sorption at water/mineral interfaces using Cu(II) as a spin probe. The major sorbed species and their motional state was identified by their EPR spectra. They showed distinct signals due to their strength of binding, local structure and motional state. The EPR results together with macroscopic sorption data show that sorption involved at least three different mechanisms depending on chemical environments (1).

REFERENCE

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