
Hydration State of Cu²⁺ in Mixed Cu²⁺-Hexadecylpyridinium Montmorillonite by Electron Spin Resonance

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Abstract: Electron spin resonance (ESR) spectra of Cu²⁺-hexadecylpyridinium (HDP) montmorillonites were investigated as a function of HDP⁺ content and the hydration state of Cu²⁺ at relative humidities of $p/p_0 = 0.52-8 \times 10^{-7}$ at 298° K. The symmetry of the Cu²⁺ ESR spectra and the intensity of the ESR signal increased upon dehydration of the complex. The HDP⁺ cation caused an increase in the hydration state of Cu²⁺ at a given p/p_0 and an increase in the covalency of the Cu-O bond.

Key Words: Cation exchange • Copper • Electron spin resonance • Hexadecylpyridinium • Hydration • Montmorillonite

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