
Electroacoustic Study of Adsorption of Cetylpyridinium Chloride on Kaolinite

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Abstract: Adsorption of cetylpyridinium chloride (CPC) onto kaolinite can be followed using the electroacoustic effect. The dynamic mobility, measured at a frequency of 1 MHz, varies from about -2 to $+1 \times 10^{-8} \text{ m}^2 \text{ V}^{-1} \text{ s}^{-1}$ in a number of steps, reflecting the adsorption of two separate layers, with the bilayer being more obvious, especially at pH 5– 8. The behaviour at different pHs reflects the different charge characteristics of the basal cleavage planes and the crystal edges. When the amount of added CPC is equal to the cation exchange capacity of the clay, the kinetic charge changes from negative to positive and there is a pronounced break in the conductivity curve. It is also possible to estimate the edge to face area from such measurements and so obtain a measure of the aspect ratio of the clay crystallites. The (minimum) value for this clay is about 5:1.

Key Words: Electroacoustics • Adsorption • Cetylpyridinium ion • Kaolin • Electrokinetics • Dynamic mobility

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