Protonation of Organic Bases in Clay—Water Systems

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Abstract: The extent of protonation of organic bases in clay—water systems depends upon the adsorptive properties of the organo-clay species involved, and upon the structure and degree of hydration of the clay system. Organic molecules that can disperse cationic charge over two or more condensed aromatic rings give rise to greater surface-induced protonation than do single-ring organic molecules with similar solution pK_a. Protonation in clay suspensions is frequently far in excess of that predicted on the basis of electrolytic suspension pH and solution pK_a of the organic base. For a given organic base, protonation in a clay film exceeds that in the suspended clay system. Protonation in an organo-clay film increases as the film moisture content decreases. The extent of protonation in organo—clay systems varies with cationic species, cationic saturation, and clay type.

Clays and Clay Minerals; August 1976 v. 24; no. 4; p. 170-176; DOI: 10.1346/CCMN.1976.0240404

Clay Minerals Society (www.clays.org)