
Absorption of Pyrimidines, Purines, and Nucleosides By Li-, Na-, Mg-, and Ca-Montmorillonite (Clay-Organic Studies XII)

G. E. Lailach, T. D. Thompson and G. W. Brindley

Department of Geochemistry and Mineralogy, The Pennsylvania State University, University Park, Pennsylvania
Materials Research Laboratory, The Pennsylvania State University, University Park, Pennsylvania

Abstract: The absorption of biologically important purines, pyrimidines, and nucleosides by Li-, Na-, Mg-, and Ca-montmorillonite has been studied in aqueous solutions over a range of pH values 2– 12. The initial organic concentrations were about 1 m.molar. The ratio clay to organic compounds was such that only up to 25 per cent of the exchange capacity could be saturated by organic cations, but, depending on conditions, up to 100 per cent of the available organic material was absorbed. Of the nineteen compounds studied, only thymine, uracil, and their nucleosides were not absorbed under the experimental conditions. Absorption occurs primarily as a cation exchange reaction under acid conditions and varies with the basicity of the compounds, their aromatic or non-aromatic character, and the possible extent of their van der Waals interaction with the silicate layers. Nucleosides generally are less strongly absorbed than their purines or pyrimidines because their non-planar structure permits less van der Waals interaction; their absorption is influenced by the differences in swelling behavior of montmorillonite with mono- and divalent cations.

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