
Microporosity in Montmorillonite from Nitrogen and Carbon Dioxide Sorption

L. A. G. Aylmore

Department of Soil Science and Plant Nutrition, Institute of Agriculture, University of Western Australia, Nedlands, W.A. 6009

Abstract: Nitrogen adsorption at 78° K and carbon dioxide sorption at 195° K on homoionic lithium, sodium, caesium, calcium, lanthanum and hexane diammonium saturated montmorillonites have been examined by means of $V-n$ plots. In the case of carbon dioxide, sorption on the lithium saturated clay was used as a standard for comparison of the other samples.

The nitrogen plots indicate that most of the surface area lies in super-micropores of approximately 10 Å equivalent plate separation. Variations between cations are attributed to differences in the structure of the porous matrix formed on drying rather than differences in the degree of entry into quasi-crystalline regions. While the initial sorption of carbon dioxide clearly is influenced by the solvation properties of the cations, the subsequent reversibility of the isotherms and linearity of the $V-n$ plots indicates that for all but the largest cations the same sorption process is occurring on surfaces external to the quasi-crystalline regions

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