Layer Charge-Cation-Exchange Capacity Relationships in Montmorillonite

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Abstract: The charge density distribution among different classes of a series of reduced charge montmorillonites is heterogeneous as in the parent Camp Berteau clay. In addition, charge reduction proceeds inhomogeneously. Up to 20% differences in charge density can be accounted for by alkyl chains extending at the edges of the clay particle. A realistic charge density-cation-exchange capacity relationship for hectorite, Otay montmorillonite, and a series of reduced charge montmorillonites of Camp Berteau is obtained by accounting for the influence of particle radius and for the extent of alkyl chains lying outside the clay layers in the charge density calculations.

Key Words: Cation-exchange capacity • Hectorite • Hofmann-Klemen effect • Layer charge • Montmorillonite

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