A Direct Procedure for Determining the Number of Plates in Tactoids of Smectites: The Na/Ca-Montmorillonite Case*

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Abstract: The dispersion of clays is of great importance in determining various soil properties such as hydraulic conductivity. A procedure which involves fixing followed by embedding of clay particles in an epoxy resin is described. This procedure enables the observation of cross sections of clay tactoids under a transmittance electron microscope, and the determination of the number of plates per tactoid. The use of the procedure for the determination of the relation between the exchangeable sodium percentage (ESP) and tactoid size in suspensions of a Na/Ca bentonite system is presented. It was demonstrated that even at ESP 5 significant dispersion already occurs, the average number of plates per tactoid being 6.6 as compared to 16.1 at ESP 0.

Key Words: Bentonite • Conductivity • Dispersion • Hydraulic • Smectite • Tactoid

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