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# Interactions of Some Large Organic Cations with Bentonite in Dilute Aqueous Systems

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**Abstract:** Adsorption studies indicate that paraquat, diquat, and thionine are bound on bentonite by amounts greater than the measured cation-exchange capacity (CEC) of the clay. Methylene blue, new methylene blue, and malachite green are bound by amounts equal to the CEC. The unipositive organocations form aggregates on the clay surface. Aggregation increases with ionic strength and increases the apparent adsorption capacity by 25%. The aggregates are removed by washing with distilled water. Desorption studies show that the dyes are irreversibly bound, whereas the dipositive organocations are reversibly bound. Ionic strength variation reduces adsorption by 15 and 36% in the monovalent and divalent organocation-clay systems, respectively. In the clay-divalent organocation systems adsorption is greater on Na-saturated clay than on K-saturated clay. Adsorption is unchanged over the pH range 4.5– 8.5 and decreases steadily below pH 4.0. Changes in adsorption due to changes in temperature are small. The study indicates that ionic strength is the most important variable in clay-organocation interactions.

**Key Words:** Adsorption • Bentonite • Herbicide • Organocations • Smectite

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