

CLAY DISPERSION IN RELATION TO ELECTROLYTES CONCENTRATION AND pH

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ABSTRACT

Dispersion of sodic and saline-sodic soils adversely influences crop and can accelerate failure of water conveyance system. The critical coagulation concentration (CCC) of montmorillonite clay was measured under different pH values. The CCC increased with the pH, showing $2.8 \text{ mol} \cdot \text{m}^{-3}$ at pH 6 and $33 \text{ mol} \cdot \text{m}^{-3}$ at pH 9 in NaCl solution. The CCC was similar in NaCl, KCl and NH₄Cl solutions below pH 6.5 and 33, 30 and 25 $\text{mol} \cdot \text{m}^{-3}$ at pH 9 showing the same order as hydrated ion radius. Montmorillonite dispersed at low sodium adsorption ratio (SAR) when electrical conductivity (EC) was less than the threshold value. The threshold EC and SAR for the clay coagulation increased with pH. At high pH mostly in case of a sodic soil, the system required EC more than the threshold for coagulation. The EC and SAR relationship may help in understanding the physical conditions of a sodic soil and provides a basic indicator for irrigation management aimed to prevent and control deterioration of soil quality.