Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting Information for

Description of colloidal particles aggregation in the presence of Hofmeister effects: On the relationship of ion adsorption energy and particle aggregation activation energy

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S1. Aggregation experimental details (divalent electrolyte solutions)

Materials

The purified montmorillonite (from WuHua TianBao Resources Co., Ltd, Inner Mongolia, China) used in this study is a 2:1-type clay mineral. The montmorillonite dispersion was prepared as follows: Samples were air dried and screened through a 0.25-mm sieve, and 50 g was then transferred into the beaker. Then 500 ml of ultrapure water was added and the pH was adjusted to 8.0 by 10 mmol L^{-1} KOH solutions. colloidal montmorillonite minerals were dispersed by the probe-type ultrasonic homogenizer (Scientz-IID, Ningbo, China) and then diluted to 5000 mL with ultrapure water. Fourth, colloidal minerals with diameter < 200 nm were collected using the static sedimentation means.

Dynamic light scattering measurement

A BI-200SM multi-angle laser light scattering instrument with an autocorrelator of BI-9000AT was employed to determine the aggregation kinetics of montmorillonite particles in various ion solutions with a wide range of concentrations. The power of laser beam was 15 mW, polarized vertically with wavelength of 532 nm. The concentrations of electrolyte were set at 0.5, 1, 2, 3, 5, 10, 15, and 20 mmol L^{-1} for $Mg(NO_3)_2$; 0.5, 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5 and 5 mmol L^{-1} for $Ca(NO_3)_2$. The montmorillonite particle concentrations in the suspension was 0.0496 g L^{-1} and each of the suspensions was ultrasonically dispersed for 2 min before adding the electrolyte. The average effective hydrodynamic diameter was measured continuously for 60 min with DLS measurement at a scattering angle of 90°. All measurements were performed at a temperature of 298 K.