## **Supplementary Materials**

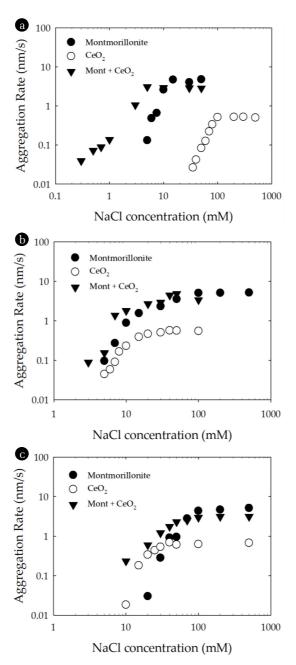


Fig. S1. Aggregation rate of montmorillonite, CeO<sub>2</sub> and a mixture. Homo- and heteroaggregation rate of montmorillonite, CeO<sub>2</sub> and montmorillonite-CeO<sub>2</sub> mixture, as a function of NaCl concentration at (a) pH 4, (b) pH 6 and (c) pH 10.

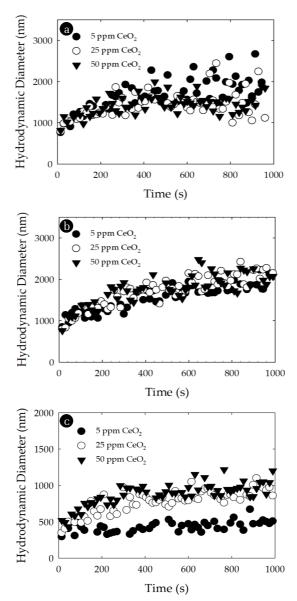


Fig. S2. Aggregation profiles of a mixture. Aggregation profiles of montmorillonite- $CeO_2$  mixture as a function of  $CeO_2$  concentration at (a) pH 4 in 3 mM NaCl, (b) pH 6 in 7 mM NaCl and (c) pH 10 in 20 mM NaCl.

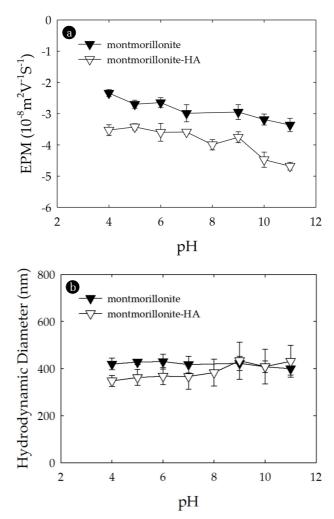


Fig. S3. (a) Electophoretic mobilities (EPMs) and (b) size of montmorillonite and HA coated montmorillonite at 1 mM NaCl as a function of pH. The error bars represent the standard deviation of repeated test.