

Abstract Submitted
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Improving the accuracy of DLVO theory for dense systems of macroions NIELS BOON, GUILLERMO IVAN GUERRERO, Northwestern University, RENE VAN ROIJ, Utrecht University, MONICA OLVERA DE LA CRUZ, Northwestern University — The widely used DLVO pair potential was originally derived for a pair of interacting macroions in a dilute colloidal suspension. Here, we present a modified effective pair potential that is also accurate for non-dilute systems. Our new theory significantly deviates from the classical DLVO theory in dense systems. In essence, we propose a modification of Alexander’s prescription for the charge renormalization procedure that is used to derive effective charges from highly charged macroions. By comparing pair correlation functions and pressures from computationally expensive primitive-model simulations, our new method demonstrates an improved accuracy w.r.t. Alexander’s DLVO-based approach. We show that our method is also suitable to describe salt-free suspensions.

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