Geophysical Research Abstracts
Vol. 20, EGU2018-15546, 2018
EGU General Assembly 2018

Attachment of Graphene oxide and montmorillonite onto quartz sand

Vasiliki I. Syngouna, Georgios I. Giannadakis, and Constantinos V. Chrysikopoulos

Technical University of Crete, Environmental Engineering Laboratory, Chania, Greece (kikisyg@yahoo.gr, ggiannadakis93@gmail.com, cvc@enveng.tuc.gr)

This study examines the interaction of GO with quartz sand and montmorillonite (STx-1b) colloids at pH=7, ionic strength IS=2 mM, and 25°C, under dynamic conditions. Moreover, the effect of pH on STx-1b kinetic attachment onto quartz sand was investigated. The experimental data suggested that pH affected slightly the attachment of STx-1b colloids onto quartz sand. GO was attached in greater amounts onto STx-1b than quartz sand. Also, the attachment of GO onto quartz sand was shown to increase slightly in the presence of STx-1b colloids. However, when GO and STx-1b coexisted, the total GO mass attached onto quartz sand, suspended STx-1b, and attached STx-1b was increased. Furthermore, the equilibrium attachment experimental data were fitted nicely with a Freundlich isotherm, and the attachment kinetics were satisfactorily described with a pseudo-second-order model. Finally, the extended DLVO (XDLVO) theory was used to quantify the various interaction energy profiles based on electrokinetic and hydrodynamic measurements.