Geophysical Research Abstracts
Vol. 14, EGU2012-1317, 2012
EGU General Assembly 2012

Attachment of bacteriophages MS2 and PhiX174 onto kaolinite and montmorillonite: extended-DLVO interactions

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This study aims to gain insights into the interaction of virus particles with clay colloids. Bacteriophages MS2 and ΦX174 were used as model viruses and kaolinite (KGa-1b) and montmorillonite (STx-1b) as model colloids. The experimental data obtained from batch experiments of MS2 and ΦX174 attachment onto KGa-1b and STx-1b suggested that virus attachment is adequately described by the Freundlich isotherm equation. Both MS2 and ΦX174 were attached in greater amounts onto KGa-1b than STx-1b with MS2 having greater affinity than ΦX174 for both clays. Furthermore, extended-DLVO interaction energy calculations explained that the attachment of viruses onto model clay colloids was primarily caused by hydrophobic interaction. The theoretical and experimental results of this study were found to be in good agreement with previous findings.