



A combined ATR-FTIR and NMR study of *Pseudomonas putida* sorption onto different kaolinite minerals

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The presence of bio-colloids (e.g. bacteria and viruses) into subsurface and groundwater could be attributed to the release of particles from septic tanks, broken sewer lines or from artificial recharge with treated municipal wastewater. Bio-colloid transport in the subsurface is significantly affected by sorption onto the solid matrix. Bio-colloid attachment onto mobile or suspended in the aqueous phase soil particles (e.g. clay or other minerals) also may influence their fate and transport in the subsurface. The present study focuses on the investigation of *Pseudomonas* (*P.*) *putida* sorption onto well (KGa-1) and poorly (KGa-2) crystallized kaolinite minerals. Batch experiments were carried out to determine the sorption isotherms of *P. putida* onto both types of kaolinite particles. The sorption process of *P. putida* onto KGa-1 and KGa-2 is adequately described by a Langmuir isotherm. Attenuated Total Reflection Fourier Transform Infrared Spectroscopy as well as Nuclear Magnetic Resonance were employed to study the sorption mechanisms of *P. putida*. Experimental results indicated that KGa-2 presented higher affinity and sorption capacity than KGa-1. It was shown that electrostatic interactions and structural disorders can influence the sorption capacity of clay particles.