



Co-transport of *Pseudomonas putida* and kaolinite colloid particles through water saturated porous media

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Groundwater contamination is often associated with the presence of dissolved contaminants and/or suspended particles, which are either harmful biocolloids or toxic substances sorbed onto colloid particles. The present study focuses on the transport of bacteria in porous media in the presence of suspended kaolinite colloid particles. The bacteria used are the species *Pseudomonas putida*. Batch sorption experiments were conducted to investigate the adsorption of *Pseudomonas putida* onto the surfaces of kaolinite particles. The results from the batch experiments indicate that *Pseudomonas putida* significantly adsorbed onto kaolinite colloid particles. The adsorption process is adequately described by a Langmuir type isotherm. Transport experiments were conducted under various flow conditions in water saturated columns packed with glass beads. Initial flowthrough experiments were performed with bacteria and kaolinite alone in order to better understand their individual transport characteristics. Finally, *Pseudomonas putida* and kaolinite colloid particles were injected simultaneously into the packed column in order to investigate their co-transport behavior. The flowthrough experimental data suggest that the presence of the clay particles significantly inhibit the transport of bacteria in water saturated porous media. The observed reduction of *Pseudomonas putida* recovery at the packed column exit is mainly attributed to the attachment of bacteria onto kaolinite particles, which are adsorbed onto the solid matrix of the column.