

Removal of trichloroethylene and perchloroethylene by micro-sized emulsion

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The feasibility of micro-sized oil emulsion was investigated to remove trichloroethylene (TCE) and perchloroethylene (PCE), which are representative dense non-aqueous phase liquids (DNAPLs), from soil and groundwater. Micro-sized emulsion can remove DNAPLs due to its large surface area and hydrophobicity. Emulsion was prepared by mechanical homogenization of silicone oil. The produced emulsion removed effectively TCE and PCE. To enhance removal of TCE and PCE, emulsion was stabilized by surfactants, SDS, Brij 30,35,56 and Tween 80 were used at the concentrations below critical micelle concentration. As a result, non-ionic surfactants with high hydrophilic/lipophilic balance (HLB) value were good for the stabilization of emulsion by increasing the amount of oil dispersed in water. TCE and PCE were effectively removed by surfactant-free and surfactant-stabilized micro-sized emulsion.