

## The preparation and characterization of micro-sized emulsion using vegetable oils for the remediation of DNAPL

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The feasibility of micro-sized emulsion using vegetable oils such as corn, soybean, sunflower and olive oil was investigated. The dense non-aqueous phase liquid (DNAPL) like trichloroethylene (TCE) could be removed from aquifer using these emulsions without the problems caused by the sorption of surfactants and downward migration of free phase or DNAPL-swollen micelles. The emulsions were prepared by homogenization of 0.5, 1 and 2 (v/v) % oil solutions at rates of 5,000 and 8,000 rpm during 5, 10 and 15 minutes. The homogenization at high rate led to the stable emulsion. The oils used in this study had similar solubilities on TCE. The emulsions made by different oils also showed similar solubilization results. TCE of 10,000 ppm could be treated by 2 (v/v) % oil emulsions, showing the residual concentrations less than the aqueous solubility of TCE.