

## Enhancement of reductive dechlorination rate of TCE using surfactants

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Chlorinated compounds such as trichloroethylene(TCE) and tetrachloroethylene(PCE) have been a representative pollutants in groundwater and soil. Zero-valent iron(ZVI) works as an electron donor in PCE and TCE reductive dechlorination. This reaction occurs at the surface of ZVI by electron transfer. Surfactants have been applied to remediate soil and groundwater because those compounds solubilize and mobilize the none-aqueous phase liquid in groundwater. In this study, the effect of surfactants on reductive dechlorination of TCE was investigated using dodecyl pyridinium chloride(DPC) as a cationic surfactant and sodium dodecyl sulfate(SDS) as a anionic surfactant. Above the critical micelle concentration(CMC) of DPC and SDS, the reaction rate decreased significantly because the solubilization of TCE into surfactant micelle interrupted the transfer of electron from iron to TCE. Below CMC of DPC, the reaction rate increased because the sorption of surfactant on the surface of iron enhanced the sorption of TCE on the complex of surfactant and ZVI. However, the rate was decreased significantly below CMC of SDS. As a result, cationic surfactant below the CMC can enhance the reductive dechlorination.