

### Removal of VOC using a jet loop reactor with the recycle of a surfactant solution

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Volatile organic compounds (VOC) are of great concern because their presence in the atmosphere may pose a significant public health risk. In this study, a jet loop reactor (JLR) with a surfactant solution was suggested to remove hydrophobic VOCs such as BTEX in the stack gas through the absorption into the surfactant solution. JLR is highly efficient for gas dispersion increasing the dissolution of gas in water.

Toluene-containing air (500–1500 ppm) and highly biodegradable Tween 81 were used in this study as a model stack gas and a model surfactant, respectively. With the addition of Tween 81 to 1.0 % (w/v), the solubility of toluene was increased more than 100 times. Experiments have been performed in a 50 liter jet loop reactor operating at room temperature. Effects of Tween 81 concentrations on the removal of toluene were studied with varying the toluene concentrations in the inlet gas. Concentrations of toluene in the aqueous phase and in the gas phase were measured using gas chromatography.