



## Inhibitory effects of polar and non-polar organic substances on activated sludge activity

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### ABSTRACT

As is well known, several organic compounds, more often found in industrial wastewater, exhibit inhibitory effects on biomass activity, therefore, leading to poor wastewater treatment efficiency. This study presents the experimental results on the inhibition effects of 14 polar and non-polar organic compounds on the activity of activated sludge in the concentration range of 50–1,000 ppm. Two different activated sludge samples used, one of low activity and another of high activity. The organic compounds tested are: phenol, 2-chlorophenol, nitrophenol, resorcinol, dioxane, acetonitrile and benzotriazole (polar); and toluene, styrene, cyclohexane, tetrachloromethane, paraxylene, benzene and hexane (non-polar). The results demonstrate that polar compounds exhibit higher toxicity than non-polar compounds and hydrophobicity plays a crucial role. The effects of polarity, hydrophobicity, solubility and volatility are discussed and the conclusion is that inhibition is complex phenomenon requiring extensive theoretical and experimental studies.

*Keywords:* Recycle activated sludge; Inhibition; OUR; Organic compounds

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