

# BATCH AND FIXED BED COLUMN ADSORPTION OF PHENOLS AND NAPHTHALENE BY ORGANO-CLAYS

Piyamaporn Jaruwong and Ratanawan (Wibulswas) Kiattikomol\*

School of Chemical Engineering, Suranaree University of Technology, Nakorn Ratchasima

30000, Thailand [atanawa@sut.ac.th](mailto:atanawa@sut.ac.th)

## Abstracts

The study concerned with removal of aromatic hydrocarbons like phenol, 3-monochlorophenol and naphthalene from water using organo-clays as an adsorbent in batch and column experiments. The organo-clays were prepared by incorporating cationic surfactant in form of Quaternary Ammonium Cation (QACs) into Montmorillonite. The precursor and organo-clays were physical characterized. Adsorption isotherm of phenols and naphthalene onto organo-clays were firstly determined by batch technique. The results informed that the presence of QACs enhanced the adsorption ability of the organo-clays while the natural Montmorillonite does not show any adsorption of phenols or naphthalene. The adsorption abilities of organo-clays in batch system were in order: naphthalene > 3-chlorophenol > phenol. An inverse relationship was observed between the sorbate water solubility and the adsorption ability of organo-clays. The adsorption rates were correlated to pseudo-second order kinetic. Column operations were performed to determine the breakthrough curves. Mixed sand-clays bed was used in column due to fine particle size of clays. The permeability the mixed bed was decreased in the presence of clays. The column adsorption indicated that the breakthrough time increases with increasing of clay quantity in the mixed bed but decreases with increasing of the initial sorbate concentration.

**Keywords :** Montmorillonite, phenols, naphthalene, column, adsorption, organo-clays

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