Effect of pH on Adsorption of Naphthalene onto Natural Bentonite and Na-Sepiolite from Aqueous Solutions

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Various toxic chemicals including polycyclic aromatic hydrocarbons, heavy metals, dyes, solvents have been discharged to the environment as industrial wastes, causing serious water, air and soil pollutions and they were also threaten the human health. Polycyclic aromatic compounds have been extensively studied and a big concern is paid to environmental subjects and due to their potential carcinogenic, mutagenic or both. The removal of these kinds of pollutants from environment can not be managed to by using conventional methods. It is now extensively recognized that adsorption provide a feasible, effective method for the removal of pollutants from wastewaters.

In this study, the effect of pH on adsorption of naphthalene, which is a polycyclic aromatic hydrocarbon, onto natural bentonite and Na-sepiolite was investigated in aqueous solutions in a batch system. The functional group characterization of natural bentonite and Na-sepiolite was done using the FTIR spectroscopic technique. The pH experiments were done at 10 mg dm$^{-3}$ and 20°C. The optimum pH values were 4.00 and 4.33 for natural bentonite and Na-sepiolite. The maximum adsorption capacities obtained from pH experiments were found to be as 2.797 mg g$^{-1}$ and 2.570 mg g$^{-1}$ for natural bentonite and Na-sepiolite, respectively. The results indicate that natural bentonite and Na-sepiolite could be used as low-cost material for the removal of organic pollutant from aqueous solutions.