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# Use of Inorgano-Organo-Clays in the Removal of Priority Pollutants from Industrial Wastewaters: Adsorption of Benzo(a)pyrene and Chlorophenols from Aqueous Solutions

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**Abstract:** Benzo(a)pyrene (B(a)P), and chlorophenols were sorbed from their respective aqueous solutions onto inorgano-organo-clays (IOCs). Cetyl pyridinium hydroxy-Al montmorillonite (CPC-hydroxy-Al montmorillonite), an IOC, containing only 11– 12% surface organic carbon by weight, bound pentachlorophenol strongly, with an observed monolayer capacity of 0.08 mmole/g. The comparable value for granulated activated carbon (GAC) was found to be 0.12 mmole/g. On the other hand, cetyl pyridinium cation-exchanged montmorillonite (CPC-montmorillonite), containing 19.2% surface organic carbon by weight, did not bind pentachlorophenol as efficiently as did IOCs. For benzo(a)pyrene, CPC-hydroxy-Al montmorillonite was found to be a better adsorbent than GAC and CPC-montmorillonite. The significant difference in the sorption potential of the two types of surfactant-laden clays for pentachlorophenol and benzo(a)pyrene was probably due to the surface orientation of the adsorbed organic carbon. For 3,5-dichlorophenol, however, both types of organo-clays exhibited weak binding, which was probably due to the greater aqueous solubility of the dichlorophenol.

**Key Words:** Adsorption • Benzo(a)pyrene • Chlorophenols • Hydroxy-Al • Inorgano-organo clay • Montmorillonite • Pollutants

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