

Use of Inorgano-Organo-Clays in the Removal of Priority Pollutants from Industrial Wastewaters: Structural Aspects

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Abstract: Novel modified clay adsorbents were prepared by blocking cation-exchange sites of an expandable clay, such as montmorillonite, with polymeric or polyvalent inorganic ions and by using cationic surfactants as sources of surface organic carbon. Electrokinetic measurements demonstrated that the adsorbed polycations were essentially nonexchangeable. Adsorption and desorption experiments revealed that about 90% of the cationic surfactant was apparently irreversibly bound to the surface. Flocculation and peptization studies were performed to establish that the adsorbed surfactant moiety was oriented with its hydrocarbon tail towards the surface. Such a configuration of simultaneously adsorbed polycations and cationic surfactants was designated as an inorgano-organo-clay (IOC). As shown in an accompanying paper, these IOCs bind priority pollutants as strongly as granulated activated carbon.

Key Words: Adsorption • Chlorophenols • Flocculation • Hydroxy-Al • Inorgano-organo clays • Montmorillonite • Pollutants

Clays and Clay Minerals; June 1990 v. 38; no. 3; p. 277-286; DOI:

[10.1346/CCMN.1990.0380306](https://doi.org/10.1346/CCMN.1990.0380306)

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