

## **A NEW TYPE OF ORGANOCCLAYS TO REMOVE ANIONIC CONTAMINANTS FROM WATER**

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Clay minerals have high cationic exchange capacities and large surface areas, which enables them to be modified by cationic surfactant to increase their total organic carbon content. The so-modified clay minerals are often called organoclays and are commonly used to remove hydrophobic organic contaminants from water. Recent discoveries indicate that under certain circumstances, clay minerals modified with cationic surfactant can be used to remove anionic contaminants from water as well. In this study, kaolinite, illite, smectite, and, for comparison, clinoptilolite zeolite were modified by hexadecyltrimethylammonium bromide to about 200 % of their cation exchange capacities. Sorption of selected anionic contaminants such as chromate, nitrate, and arsenate, by this new type of organoclays was studied under different pHs and ionic strengths. The results show that both surfactant sorption on clay minerals and subsequent anionic contaminant sorption on organoclays follow a Langmuir type sorption isotherm. Negatively charged clay mineral surfaces reverse into positively charged ones at 200 % of clay's cation exchange capacity, which is responsible for the sorption of anionic contaminants. Quantitative desorption of counterions due to sorption of chromate or nitrate indicates that sorption of anionic contaminants on organoclays is due to surface anion exchange. The results show a potential new application of organoclays to intercept migrations of anionic contaminants.