研究・技術論文

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Creation of Nano-Layered Reactors Using the Concerted Effect of Layered MnO_2 and Surfactants and Their Effect on Adsorption of Nonionic Dyes.

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層状MnO_2と界面活性剤の協奏効果を利用したナノ層状リアクターの創製と非イオン性色素に対する吸着への影響

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Creation of Nano-Layered Reactors Using the Concerted Effect of Layered MnO_2 and Surfactants and Their Effect on Adsorption of Nonionic Dyes.

by

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Abstract

Layered manganese oxide thin films (nanolayered reactors) with trimethylstearylammonium chloride ($(C_{18}H_{37})(CH_3)_3NCl$) as an interlayer ion have been prepared. Various spectroscopic analyses showed that the nanolayered reactors with $(C_{18}H_{37})(CH_3)_3NCl$ interlayer adsorbed 61.5% of fluorescein (FOS) from aqueous solution. The adsorption mechanism is considered to be ion adsorption in charge compensation due to the discharge of counter ions (Cl^-) out of the system from within the interlayer of the nano-stratified reactors; FOS becomes anionic through proton dissociation of COOH due to the development of conjugation system, and the FOS adsorbed in aqueous solutions with a concentration of 61.5%. The charge compensation and adsorption are thought to be caused by the intercalation of FOS into the interlayer of the nano-stratified reactors. When the nano-stratified reactors were changed to a lower potential, the adsorption of FOS from aqueous solution decreased. This may be due to the increase of $(C_{18}H_{37})(CH_3)_3NCl$ intercalated into the interlayer by changing the potential of the nano-stratified reactors to lower, and the increase of hydrophobicity of the nano-stratified reactors.

Key words：layered manganese oxide, δ -MnO_2, adsorption, pigment, surfactant

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