Environmental Engineering and Management Journal

July 2010, Vol.9, No. 7, 953-960
http://omicron.ch.tuiasi.ro/EEMJ/

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ADSORPTION OF 2,4-DINITROPHENOL AND 2,6-DINITROPHENOL
ONTO ORGANOCLAYS AND INORGANIC-ORGANIC
PILLARED CLAYS

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Abstract

The adsorption of two substituted nitrophenols, 2,4-dinitrophenol and 2,6-dinitrophenol on smectite clay modified by intercalation
of hexadecylpyridinium bromide (O-Sa01) or hexadecylpyridinium bromide and complex hydroxy-aluminum (IO-Sa01) were
studied. The adsorption experiments were conducted in batch mode. The results obtained show that adsorption increases with the
initial concentration of the nitrophenols and equilibrium is reached within a short period of time (20 min). The maximum capacity
uptake from waste water was 28.07 and 28.58 mg g⁻¹ for O-Sa01 and IO-Sa01 respectively for an initial concentration of 18.40
mg L⁻¹ of 2,4-dinitrophenol; and 24.65 and 26.62 mg g⁻¹ of 2,6-dinitrophenol for O-Sa01 and IO-Sa01, respectively, for the same
initial concentration as in the case of 2,4-dinitrophenol. Separation factor RL indicates that the adsorption of the nitrophenol
compounds studied is more favorable on IO-Sa01. Adsorption was modeled by the equations of Langmuir, Freundlich, and
Temkin. Kinetic data were described by the pseudo-first order and pseudo-second order equations. Based on the linear correlation
coefficient (>0.97), the Langmuir model better represented the data.

Key words: adsorption, isotherm, modified clays, nitrophenols

Received: May 2010; Revised final: July 2010; Accepted: July 2010

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