São Paulo - Brazil - May - 22nd to 24th - 2013

4th INTERNATIONAL WORKSHOP
ADVANCES IN CLEANER PRODUCTION

''INTEGRATING CLEANER PRODUCTION INTO SUSTAINABILITY STRATEGIES''

Adsorption of Acid Orange 8 from Aqueous Solution onto Zeolites Synthesized from Coal Fly Ashes Modified by Surfactant

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Abstract

The adsorption of Acid Orange 8 (AL8) over zeolites from coal fly ashes modified by surfactant was evaluated. The coal ashes used in the synthesis of zeolite (ZCC) by alkaline hydrothermal treatment were collected in thermal power plants Jorge Lacerda (SC) and Figueira (PR). The modification of zeolites was performed by mixing ZCC with the surfactant hexadecyltrimethylammonium bromide and the materials obtained were modified zeolite Jorge Lacerda (ZMJ) and modified zeolite Figueira (ZMF). The dye adsorption equilibrium was reached after 90 min for ZMF and ZMJ. The experimental data were best fitted to the kinetic model of pseudo-second-order for both adsorbents. The adsorption equilibrium was described in terms of Langmuir and Freundlich isotherms and Freundlich model was the most compatible with the experimental data for ZMJ and ZMF. The maximum adsorption capacities were 5.29 mg g^{-1} for the AL8/ZMJ and 1.79 mg g^{-1} for the AL8/ZMF.

Keywords**:** *zeolite*; *coal fly ashes; modified zeolites; acid dye; adsorption*.