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## AN INVESTIGATION OF THE SORPTION OF ACID ORANGE 7 FROM AQUEOUS SOLUTION ONTO SOIL

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### Abstract

The goal of the study was to investigate the sorption behavior of Acid Orange 7 (C.I. 15510) onto soil collected from Iasi area (Romania). The sorption isotherm, kinetic and thermodynamic studies were performed by batch mode. The effects of experimental parameters such as contact time, pH value (2-12) and temperature (20 - 40°C) have been studied. Also the influence of initial dye concentration (10 - 100 mg/L) and sorbent dosage (from 5 g L<sup>-1</sup> to 150 g L<sup>-1</sup>) were studied. It was found that equilibrium sorption amount increases with the increase in initial dye concentration, contact time, temperature and solution acidity.

The experimental data were analyzed using four isotherm models, Langmuir, Freundlich, Temkin and Dubinin-Radushkevich. Sorption of Acid Orange 7 onto soil followed the Freundlich model. The pseudo first-order, pseudo second-order and intraparticle diffusion equations were selected to analyze the sorption kinetic. Kinetic parameters, such as rate constants, equilibrium sorption capacities and correlation coefficients were calculated and discussed for each kinetic equation. It was shown that the sorption of Acid Orange 7 onto soil is well described by the pseudo second-order model. The thermodynamic study indicates that the sorption of Acid Orange 7 onto soil is spontaneous and endothermic.

*Key words:* Acid Orange 7, isotherm, kinetic models, soil, sorption, thermodynamics

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