***"Gheorghe Asachi" Technical University of Iasi, Romania***

# ADSORPTION OF RY 125 DYE FROM AQUEOUS SOLUTION ON A SILVER DOPED TiO$_2$ MODIFIED CLINOPTILOLITE

**Liliana-Andreea Colar[1], Laura Cocheci[1], Elida-Cristina Ilinoiu[1],
Florica Manea[1], Corina Orha[2], Rodica Pode[1]***

[1]*"Politehnica" University of Timisoara, Faculty of Industrial Chemistry and Environmental Engineering,
2 Victoriei Sq., 300006 Timisoara, Romania*
[2]*Department of Condensed Matter, National Institute of Research-Development for Electrochemistry and Matter Timisoara,
1 Plautius Andronescu, 300224 Timisoara, Romania*

## Abstract

The aim of the present work was to study the dark adsorption of Reactive Yellow 125 (RY 125) using a silver doped TiO$_2$ modified clinoptilolite (Z-TiO$_2$-Ag) envisaging its further application in heterogeneous photocatalytic oxidation. Several kinetic models, *i.e.*, Lagergren, Ho-McKay, Dumwald-Wagner intraparticle models were tested to elucidate some adsorption mechanistic aspects. The pseudo-second order kinetic model proposed by Ho and McKay was the most suitable in describing the adsorption kinetic of RY 125 dye onto Z-TiO$_2$-Ag. The solid-liquid equilibrium experimental data were correlated with four mathematical models, *i.e.*, Langmuir, Freundlich, Dubinin-Radushkevich and Harkin-Jura. The Freundlich isotherm approximated the best the experimental data. A physical nature of adsorption process was found based on the value of the free energy of adsorption, $E_{DR} = 0.796$ kJ mol$^{-1}$, calculated from Dubinin-Radushkevich, and on the values of Harkin-Jura model parameters, as well as. This aspect was also supported by Zeta potential measurements for Z-TiO$_2$-Ag suspension in RY 125 dye solution.

*Key words:* adsorption, equilibrium, kinetics, reactive dye, silver doped TiO$_2$ modified zeolite

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* Author to whom all the correspondence should be addressed: e-mail: rodica.pode@chim.upt.ro