EXPERIMENTAL STUDY AND MODELLING OF DIFFERENT ZEOLITE TYPE ADSORPTION

Mihaela-Ligia UNGURESAN¹, Eva-Henrietta DULF², Francisc-Vasile DULF³

¹ Department of Chemistry, Faculty of Materials Science and Engineering, Technical University of Cluj-Napoca, 400641 Cluj-Napoca, Romania
² Department of Automation, Faculty of Automation and Computer Science, Technical University of Cluj-Napoca, 400027 Cluj-Napoca, Romania
³ Department of Chemistry, Faculty of Agriculture, University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca, 400372 Cluj-Napoca, Romania

(mihaela.unguresan@chem.utcluj.ro; Tel. 0264 401 622, Fax: 0264 415 054)

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The different types of natural zeolite are evaluated in this study. The equilibrium and kinetic characteristics of natural zeolites from different zones were studied in these experiments. The studied zeolites are: zeolite from Cepari Vultureni (CV) zone – with iron impregnation, zeolite from Mâcicaș (M) zone – with iron impregnation and zeolite from Mâcicaș (M) zone – with copper impregnation. Four isotherms, Langmuir, Freundlich, Langmuir-Freundlich [1], and Redlich-Peterson models, were used for fitting the experimental data obtained for each type of zeolite for two different initial concentrations: 22.93 mg/L and 10 mg/L. The different concentration values were used to investigate the effect of initial concentration on the transient behaviour of zeolite. The parameters in the adsorption isotherms were estimated from the experimental equilibrium data using MATLAB [2]. Using these data the best isotherm can be selected. The different isotherm constants were determined by regression of the experimental data. Due to inconvenience of evaluating three isotherm parameters, the two-isotherm-parameter equations (Langmuir, Freundlich, Langmuir-Freundlich) are more widely used than the three-isotherm-parameter equation (Redlich-Peterson equation). Though, the three-isotherm-parameters equations mostly provide a better fit of the isotherm data than a two-isotherm-parameters one.

References