EXPERIMENTAL STUDY AND MODELLING OF DIFFERENT ZEOLITE TYPE ADSORPTION

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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 zeolits are: zeolite from Cepari Vultureni (CV) zone – with iron impregnation, zeolite from Mâcicaş (M) zone – with iron impregnation and zeolite from Mâcicaş (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