

REMOVAL OF METHYLENE BLUE FROM AQUEOUS SOLUTION BY ADSORPTION

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The paper presents the results of laboratory tests concerning the possibility of utilizing activated carbons produced in Poland, as well as of non-conventional adsorbents, such as modified Clarion clay and clinoptylolite, for removing methylene blue from water. The objective of tests carried out was a quantitative formulation of the adsorption process, as well as the determination of the effects of various factors on its course. The attempt was taken to solve the tasks defined in the objective of the study using model experimental systems. The methylene blue solution in concentration 20 mg/dm^3 , prepared on the basis of distilled water, was used as adsorbate. Adsorption processes, conducted in batch mode (in no-flow conditions), were best described by the Freundlich isotherms. On the basis of the isotherms the adsorptive capacity of tested adsorbents was calculated. The through-flow conditions were realized by a columnar filtration method. On the basis of obtained results the breakthrough curves (isoplanes) were plotted. The adsorptive capacities, determined on the basis of isoplanes reached 27–41 mg/g, 14.89 mg/g and 5.54 mg/g for activated carbons, modified Clarion clay and clinoptylolite, respectively. Exit curves (isoplanes) served for defining the mass transfer zone (the adsorption front height), as well as for calculating the mass-exchange-zone moving rate. Despite their inferior adsorptive characteristics the modified Clarion clay and clinoptylolite may be taken into account as shielding materials in relation to activated carbons.