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## Adsorption of solophenyl red 3BL polyazo dye onto amine-functionalized mesoporous carbons

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### Abstract

Mesoporous carbon of cubic structure was functionalized with ethylamine, ethylenediamine, diethylenetriamine and triethylenetetramine at 40°C for 8 h. The mesostructure and textural parameters of the new materials were determined by X-ray diffraction and low-temperature nitrogen sorption techniques. The functional groups present on the surface of the samples were identified by FT-IR and thermogravimetric studies. Functionalization of the mesoporous carbon led to reduction of the surface area and pore volume as well as to an increase in the mean pore diameter. The micropores/small mesopores can be blocked by the attached surface amino groups. We found that after functionalization the mesostructural regularity was still maintained. A key element of the study was a series of adsorption tests of solophenyl red 3BL polyazo dye onto amine-functionalized mesoporous carbons from aqueous solutions. The influence of the process time, concentration of adsorbate, pH and temperature on the efficiency of the adsorption process was analyzed. The samples modified with amine groups were found to show much higher sorption capacities towards solophenyl red 3BL than pure carbon. It is a results of formation of a large number of positive surface sites that interact with anionic adsorbate. The adsorption kinetics was found to follow closely the pseudo-second-order kinetic model. The results of the intraparticle diffusion model suggested that

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