Removal of azo dye from aqueous solution by adsorption onto activated clay. Part II: response surface methodology approach.

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Abstract. The study of adsorption of eriochrome black T (EBT) was carried out in a batch reactor. It consisted of the optimization and the modelling of the removal of EBT by adsorption on an activated bentonite. The use of a design of experiments (DOE) approach, in this case the response surface methodology (RSM), allowed the determination of the influence of the principals' effects and the interaction of the operational parameters on the rate of the adsorption. The results describe correctly the influence of the experimental parameters on the adsorption rate and the predicted values were in good agreement with the experiment data. The analysis of variance (ANOVA) showed that the proposed model was highly significant. The response surface methodology (RSM) used to optimize the amount of EBT adsorbed acting on the experimental conditions indicates that this method is a reliable for determining the optimum operating conditions of the dye adsorption process on the clay.

Keywords: adsorption, clay, eriochrome black-T, DOE, RSM, optimization.