

Molczan, M. Effect of Agitation Conditions on the Kinetics of Organic Matter Removal from Water by Magnetic Anion Exchange. *Ochrona Srodowiska* 2012, Vol. 34, No. 4, pp. 9–16.

Abstract: Despite their significance in the anion exchange process involving a MIEX[®] resin, the mode and speed of agitation have rarely been addressed in the literature. Experimental data were presented in the form of kinetic curves described by the equation of the pseudo-first order chemical reaction. The values of the coefficients of this equation were used for interpreting the results of the study. The results obtained with a model water solution containing natural organic substances (color, about 55 gPt/m³; absorption at UV_{254nm}^{1m}, about 42; DOC, about 7.5 gC/m³) have revealed that agitation speed largely contributed to the kinetics of natural organic matter removal in the MIEX[®] resin process, but only slightly affected the value of adsorption. Gradual decline in the increment of adsorption was observed over the entire range of the agitation speed tested (100 to 300 rpm). Far more significant was the effect of agitation speed on the rate of organic matter removal. This relation was a linear one within the whole agitation speed range examined, where the reaction rate increased by 80 to 90%, depending on the parameter that describes the organic matter content of the water (DOC, color, UV absorbance).

Keywords: Water treatment, ion exchange, MIEX[®] resin, natural organic matter, jar test, agitation speed, pseudo-first order kinetic model.