Adamski, W., Molczan, M. Modelling of Magnetic Field Assisted Fluidization of MIEX® Ion Exchange Resin in Water Treatment System. ***Ochrona Srodowiska*** **2014, Vol. 36, No. 4, pp. 9–14.**

Abstract: Principles of MIEX®DOC process and its technical solution with a complete-mix reactor and fluidized plug-flow reactor have been discussed. The influence of magnetic interactions between the resin grains on its ability to maintain a compact layer in the fluidized reactor was investigated. The results of fluidized state simulation for nonmagnetic particles of certain shape, size and density were compared with the experimental results received for particles of the same parameters except for being magnetic. On this basis fluidization model parameters for the resin bed with magnetic properties were determined. The magnetic interaction constant ($v_M=v_s-v_{st}$) between the ion exchange resin grains was defined as a difference between the actual terminal sedimentation velocity (allowing certain bed expansion as a function of fluidization velocity – v_e) and the theoretical terminal sedimentation velocity ($v_{st}=12$ m/h) of the resin grains. The value of constant $v_M=30.5$ m/h is obligatory at the fluidization velocities below the threshold (10 m/h). The model developed enables defining the fluidized bed geometry which is necessary for analytical determination of MIEX®DOC process efficiency using mathematical models.

Keywords: Organics removal, ion exchange, resin fluidization, fluidization velocity, magnetic properties.