**Guminska, J. Modification of Conventional Coagulation System by Application of Post-coagulation Sludge Recirculation.** ***Ochrona Srodowiska*** **2013, Vol. 35, No. 3, pp. 17–22.**

**Abstract:** Treatment process optimization aiming to remove dissolved organic compounds requires coagulation to be carried out according to the sweep coagulation mechanism. When carried out under conditions of oversaturation with hydrolysis products, coagulation results in excessive residual aluminum in the form of fine particles in the settling tank effluent. In the pilot tests effect of mixing conditions of the recirculated sludge and water (post-coagulation sludge recirculation to hydraulic mixer or to flocculator) on the particle content reduction efficacy has been determined. Influence of mixing conditions of water and the recirculated sludge on potential improvement of dissolved organic compound removal efficacy has also been evaluated. It was shown that coagulation-based water treatment system with post-coagulation sludge recirculation (both to flocculator and hydraulic mixer) can reduce negative effects of sweep coagulation. Higher efficacy was obtained for a system with sludge recirculation to flocculator. Due to raw water quality variability and high effectiveness of conventional coagulation, attempts to reduce the dissolved organic compound content further by post-coagulation sludge recirculation were ineffective.

**Keywords:** Water treatment, sweep coagulation, prehydrolyzed coagulant, mixing conditions.