

Guminska, J. Effect of Post-coagulation Sludge Recirculation on the Efficiency of Water Treatment Involving Coagulation. *Ochrona Srodowiska* 2012, Vol. 34, No. 3, pp. 19–23.

Abstract: Pilot tests have produced the following findings. The inclusion of recirculation of post-coagulation sludge into the conventional coagulation system improved the efficiency of the sedimentation process, especially with respect to suspended fine particle ($\sim 1 \mu\text{m}$) removal. Determination of the desired extent of recirculation made it possible to significantly reduce the number of non-agglomerated suspended particles in the effluent from the settling tank and, at the same time, maximize the efficiency of organic matter removal from the water being treated. No effect was observed of the extent of recirculation on the efficiency of dissolved organic matter removal from the water. Regardless of whether the treatment process was conducted with or without recirculation, the reduction in UV absorbance (254 nm) in the case of filtered samples averaged between 55% and 60%. When the water treatment process follows the mechanism of sweep coagulation, the extent of recirculation will require control based not only on the number of particles in the effluent from the settling tank, but also on the feedback principle minimizing their number. To reliably assess the efficiency of the coagulation process, it is necessary to measure the number of particles in the water after sedimentation – in addition to water turbidity control.

Keywords: Water treatment, sweep coagulation, post-coagulation sludge, recirculation, pre-hydrolyzed coagulant, stream current analyzer.