

Szlachta, M., Adamski, W. Effect of Powdered Activated Carbon on the Settleability and Adsorptive Properties of Coagulation Sludge. *Ochrona Srodowiska* 2009, Vol. 31, No. 1, pp. 37–40.

Abstract: The paper addresses the problem of how the powdered activated carbon (PAC) applied during coagulation affects the settling and adsorptive properties of coagulation sludge. The quantity of the settled flocs was related to the PAC dose used, whereas the adsorptive capacity of the sludge produced in the processes of coagulation and PAC-aided coagulation was determined in relation to the dissolved organic substances (expressed as DOC and UV absorbance) that were present in natural water. PAC-aided coagulation was found to substantially improve the settling properties of the coagulation sludge, thus making it possible to achieve a comparable efficiency in a time by approx. 50 to 75% shorter than the time of two hours adopted for sedimentation in our study. Kinetic analysis of PAC sedimentation has revealed that after 2 hours of the process approx. 18% of the adsorbent persisted in the water on average. For this reason it is recommended that during optimisation of the PAC-aided coagulation process particular consideration should be given to the sequence in which the coagulant and adsorbent are dosed, in order to reduce the risk that the PAC grains will penetrate into the treated water. The sludge produced in the processes of coagulation and coagulation–PAC adsorption displayed a capacity to adsorb dissolved organic substances from the treated water. The efficiency of adsorption onto the coagulation sludge, however, was poor as compared to the sludge produced during the process where coagulation was combined with PAC adsorption.

Keywords: Water treatment, coagulation, adsorption, powdered activated carbon (PAC), sedimentation, coagulation sludge.