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Abstract: Efficient removal of organic matter from surface waters is a key issue in treatment technologies where use is generally made of the coagulation process. Among the various decisive factors in the applicability of coagulation to organic substance removal, the type of the pollutant and the mode of its occurrence in the water being treated are of particular significance. In this paper consideration is focused on the removal of total organic carbon, as well as its biodegradable and refractive fractions, from surface water *via* volume coagulation with poly-aluminium chloride (PAX-XL3) and sedimentation. The efficiencies of the two unit processes are referred to as "efficiency of coagulation". Analysis of the results of studies has revealed that the quantity of organic substances removed was primarily influenced by the initial organic matter content, and in the case of TOC, DOC, and NBDOC also by the coagulant dose applied (although the latter influence was found to be weaker). It has been demonstrated that the efficiency of organic fraction removal decreased in the following order: $\Delta[TOC] > \Delta[DOC] > \Delta[NBDOC] > \Delta[NDOC] > \Delta[BDOC] > \Delta[AOC]$. The extent of removal for the biodegradable fractions, however, was insufficient in terms of the biological stability of the water being treated.

Keywords: Organic matter, biodegradable dissolved organic carbon, assimilable organic carbon, refractive substances.