

Krupinska, I., Kowalczyk, W., Szczepaniak, G. Effect of Coexistence Ratio of Organic Substances and Total Iron in Groundwater on its Treatment Efficacy. *Ochrona Srodowiska* 2013, Vol. 35, No. 3, pp. 27–34.

Abstract: Laboratory research was carried out on groundwater containing iron-organic complexes. For this reason oxidation (O_2 and $KMnO_4$) and coagulation (alum and polyaluminium chloride Flokor 1.2A) processes were applied for water treatment. It was concluded that with increase in the coexistence ratio of organic substances and total iron in water ($D=[TOC]/[Fe]$), efficacy of Fe(II) to Fe(III) oxidation with dissolved oxygen decreased, while the oxidation time was increasing. This rule was not demonstrated for $KMnO_4$ when used as an oxidizing agent. Laboratory tests revealed that the coagulation process markedly increased efficacy of groundwater contaminant removal; the efficacy depended on oxidizing agent and coagulant type and increased with their dose. Additionally, it was shown that for water samples after aeration, varying by the value of the coexistence ratio, an increase in the ratio was accompanied by decrease in the efficacy of contaminant removal in the coagulation process.

Keywords: Water treatment, aeration, oxidation, potassium manganate(VII), iron-organic complex, coagulation.