

Wlodyka-Bergier, A., Bergier, T. Influence of UV Disinfection on Halogen Water Chlorination By-Product Formation Potential in Water Distribution System. *Ochrona Srodowiska* 2013, Vol. 35, No. 3, pp. 53–57.

Abstract: Variations in halogen chlorination by-product formation potential after UV disinfection in four water treatment plants were studied. Formation potential of the following compounds has been examined: trihalomethanes (trichloromethane, bromodichloromethane, dibromochloromethane, tribromomethane), haloacetic acids (monochloroacetic acid, monobromoacetic acid, dichloroacetic acid, trichloroacetic acid, bromochloroacetic acid, dibromoacetic acid), haloacetonitriles (trichloroacetonitrile, dichloroacetonitrile, bromochloroacetonitrile, dibromoacetonitrile), halo ketones (1,1-dichloropropanone, 1,1,1-trichloropropanone), chloral hydrate and chloropicrin. Water samples prior to and after UV irradiation were chlorinated with sodium hypochlorite at a dose resulting in $3\div 5$ gCl₂/m³ of free residual chlorine after 24 h. The highest increase in the formation potential of all examined chlorination by-products was observed in water where the highest UV irradiation dose was applied. Additionally, it was stated that prior chemical oxidation may lead to increase in the examined product formation potential. It was proved that UV disinfection may also lead to increase in the amount of product bromide derivatives in water of high bromide content. Finally, nitration of organic compounds was demonstrated for water samples after UV irradiation. This phenomenon may lead to increase in nitrogen-containing chlorination by-product content.

Keywords: Water treatment, oxidation, UV disinfection, disinfection by-product formation potential.