



HRVATSKI SKUP KEMIČARA I KEMIJSKIH INŽENJERA

s međunarodnim sudjelovanjem | 4. simpozij "Vladimir Prelog"

9. – 12. travnja 2019. • Šibenik, Amadria Park (Solaris)

CROATIAN MEETING OF CHEMISTS AND CHEMICAL ENGINEERS

with international participation | 4th Symposium "Vladimir Prelog"

April 9–12, 2019 • Šibenik, Amadria Park (Solaris), Croatia

ORGANIZATORI / ORGANIZERS:

Hrvatsko društvo kemijskih inženjera i tehnologa
Croatian Society of Chemical Engineers

Hrvatsko kemijsko društvo
Croatian Chemical Society

Knjiga sažetaka

Book of Abstracts

Šibenik, Amadria Park (Solaris)



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HRVATSKO DRUŠTVO
KEMIJSKIH INŽENJERA I
TEHNOLOGA

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Fotografija Šibenika: Zvonimir Katančić | dizajn: Zdenko Blažeković

Determination of haloacetic acid in drinking water in Croatia Određivanje halooctenih kiselina u vodi za piće u Hrvatskoj

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The most commonly used disinfectants for the treatment of drinking waters are chlorine and its compounds, and the reasons for that are: lower costs, protection against microbial recontamination and minimum level of chlorine residual throughout the distribution system due to high oxidizing potential [1]. Because of its activity, chlorine can also react with natural organic matter (NOM) present in water and form disinfection byproducts (DBP) [2]. In 1974 Rook [3] identified and reported chloroform and other trihalomethanes in chlorinated drinking water as the first DBPs. Since then studies described approximately 600 – 700 DBPs which are formed by the common disinfectants. Trihalomethanes (THMs) and haloacetic acids (HAAs) make up more than 80% of the total number [4]. According to epidemiological studies, long-time exposure to high levels of DBPs has been associated with an increased risk of bladder cancer among men. Several studies are associating kidney, liver, pancreas, breast, brain cancer and pregnancy outcomes such as fetal growth with exposure to DBPs [5]. US Environmental Agency has established maximum contaminant level for total trihalomethanes (TTHM) at 80 µg/L and for sum of five HAAs at 60 µg L⁻¹ [6]. However, there is no limit for HAAs in Croatia, only for TTHM which is 100 µg L⁻¹ [7].

The aim of this work was to measure HAA levels in tap waters in different parts of Croatia. Ammonium chloride was added to the Winkler glass bottles prior to sampling to convert free chlorine residual in the sample matrix into combined chlorine. Tap was opened and the system was allowed to flush the bottles and samples were collected from the flowing system. Modified US EPA Method 552.3 was used for the determination of the HAAs. The method uses gas chromatography system coupled with an electron capture detector and a capillary column. In addition, total organic carbon (TOC) was determined in order to study its correlation with HAA.

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Acknowledgment: This work was supported by the Croatian Science Foundation under the project UIP-2017-05-3088.