

Investigation of Amount and Effective Factors on Trihalomethane Production in Potable Water of Ardabil

Back ground & Objectives: Chlorine is used as the most common water disinfectant to provide sanitary water. Chlorine reaction with organic matter in water generates a large number of disinfection By-products in drinking water. Among these products, trihalomethanes are a group of chemicals that are the most common. Trihalomethanes are a potential health problem for human and animal health. Therefore, continuous measurement and monitoring of trihalomethanes in drinking water is essential. The aim of this study was to determine the amount and effective factors in the formation of trihalomethanes in drinking water City of Ardabil.

Methods : This descriptive-analytic study was conducted on a cross-sectional basis. The city of Ardabil was classified according to a geographical map in eight main directions and one center point, and in each case, three samples of water and a total of 25 samples of the city were taken from the distribution network of drinking water in the summer of 2017. Simultaneously with sampling at the site of the rate Temperature, pH, and free residual chlorine were measured. The samples were analyzed by the GC-MS device of Agilent Technologies 7890A-Agilent Technologies 5975 C using Headspace method

Finding: The results showed that the average concentration of CHCl_3 , CHBrCl_2 , CHBr_2Cl and CHBr_3 was 11.94, 14.12, 93.5 and 94.9 $\mu\text{g/l}$, respectively. Also, the highest concentrations for CHCl_3 , CHBrCl_2 , CHBr_2Cl and CHBr_3 were determined to be 20.27, 25.21, 10.20 and 2.88 $\mu\text{g/l}$ respectively. The poor correlation between the increase of temperature and pH of water and the concentration of trihalomethanes was seen, So that with increasing temperature and pH the concentration of trihalomethanes increased, a weak and inverse relationship was observed between the concentration of free residual chlorine and the concentration of trihalomethanes.

Conclusion: The average concentration of trihalomethanes in the drinking water is within the permitted limits.

Key words: trihalomethane, GC, drinking water, Ardabil