

10675-PREDICTING THE FORMATION OF TRIHALOMETHANES AND HALOACETIC ACIDS IN SURFACE WATERS BY LINEAR REGRESSION MODELS

Anastasia D. Nikolaou, George V. Arhonditsis, Spyros K. Golfinopoulos, Themistokles D. Lekkas

Department of Environmental Studies, Water & Air Quality Laboratory, University of the Aegean, Karadoni 17, Mytilene 81100, Greece
[tel: +30-2510-36226, fax: +30-2510-36099, e-mail: nnikol@aegean.gr]

The formation of organic by-products during water chlorination was investigated, with emphasis on the groups of trihalomethanes and haloacetic acids. These compounds, in their majority carcinogens and mutagens, have adverse effects on human health.

Surface waters from different sources were chlorinated and analyzed for trihalomethanes, haloacetic acids, haloacetonitriles, haloketones, chloral hydrate and chloropicrin. The analysis was performed by gas chromatographic techniques. In the chlorinated samples, the most commonly encountered compounds were trihalomethanes and haloacetic acids. Haloacetonitriles, haloketones and chloral hydrate were present at much lower concentrations.

Analysis of variance (ANOVA) was used to determine the statistical significance of different parameters on the formation of these compounds. The parameters tested were organic matter content (measured as UV-272 nm), chlorine dose and reaction time.

Linear regression was applied for development of models predicting the concentrations of total trihalomethanes and total haloacetic acids formed during this investigation. The models include the parameters mentioned above. Comparison between predicted and observed values of concentrations of trihalomethanes and haloacetic acids showed that the developed models provide satisfactory estimations of the formation of these compounds under the particular chlorination conditions.