

Analysis for organohalogen compounds formed during seawater chlorination

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Seawater used as cooling water in coastal power stations is generally treated with chlorine to prevent marine fouling. During this seawater chlorination, organohalogen compounds containing bromine are mainly formed. Trihalomethanes (mainly bromoform) have been already studied, but other compounds are hardly known. We have been studying the formation of organohalogen compounds during the chlorination of drinking water and seawater. In this paper we will report the by-products of seawater chlorination, mainly dibromoacetic acid (DBAA).

Method for the identification and determination of DBAA in a chlorinated seawater has been developed. DBAA in a chlorinated seawater was concentrated by solvent extraction technique using diethyl ether followed by the methyl ester derivatization. The solution obtained was analyzed by gas chromatography/mass spectrometry in electron impact ionization mode. The mass spectrum obtained from a chlorinated seawater sample was similar to that of an authentic compound of DBAA. This result indicated the presence of DBAA in the chlorinated seawater.

For the routine method for determination of DBAA in chlorinated seawater, an electron capture gas chromatography preceded by the solvent extraction technique was developed and applied to the chlorinated seawater samples. Results showed that DBAA was detected in the chlorinated seawaters used in plant and a swimming pool. The DBAA concentrations in a chlorinated seawater samples used in plant, and a swimming pool were about 4, and 18 $\mu\text{g/L}$, respectively. DBAA concentration in chlorinated seawater samples used in plant was proportional to that of bromoform, and the ratio of DBAA to bromoform concentration was calculated about 20%.