

Trihalomethanes (THMs) formation in a distillation process.

Bassam Tawabini

Civil Engineering

January 1987

Abstract

This study was conducted to investigate the fate of Trihalomethanes (THMs) formation in the distillation process. The effect of humic substances concentration levels; pre and post chlorine dosages; aeration; time of contact; and temperature were evaluated. Humic substances used in this study were extracted from the Gulf water using Amberlite XAD-2 resin.

Empirical formulas were developed based upon the experimental data. The following general empirical equation was found to fit the reaction rates:

$$\text{Log (THN)} = A * \text{Log (Cl)} + B * \text{Log (TOC)} + C$$

Where THM is the total Trihalomethanes in g/l ; a, B and C are the estimated constants. The result of this study shows that for a given humic substances concentration in the seawater, Trihalomethanes formation increases as chlorine dosage, contact time, and temperature increases. The pre-chlorination and aeration steps causes a reduction in the Trihalomethanes level. In all cases studied, bromoform (CHBr₃) was the major component of the total Trihalomethanes formed, followed by CHCl₂Br, CHClBr, and CHCl₃ in sequence.