

# Relationship between chlorine consumption and chlorination by-products formation for model compounds

張怡怡

Chang E.E.\*;Chaing P.C.;Chao S.H.;Lin Y.L;

摘要

## Abstract

The objective of this research is to investigate the relationship between chlorine decay and the formations of disinfection by-products (DBP), including trichloromethane (TCM) and chloroacetic acid (CAA) in the presence of four model compounds, i.e., resorcinol, phloroglucinol, p-hydroxybenzoic acid, and m-hydroxybenzoic acid. The chlorine degradation in model compounds with OH and/or COOH functional groups were rapid after chlorination. The TCM yields of carboxylic group substituted compounds (3-hydroxybenzoic acid [3-HBA], 4-hydroxybenzoic acid [4-HBA]) were found to be lower than that of the m-dihydroxy substituted compounds. Phloroglucinol, with one more OH substitution group than resorcinol, tends to form significant amounts of CAA after chlorination. However, it was observed that with the COOH substitution of 3-HBA and 4-HBA tend to exhibit more CAA formation potential than resorcinol. The developed parallel second and first-order reaction model for chlorine demand has been successfully utilized for TCM, CAA and DBP formation modeling. A high correlation between CAA and TCM was observed for the model compounds.