

Formaldehyde Formation During Ozonation Of Drinking Water

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Abstract:

Partial oxidation of natural organic material during ozonation produces oxygenated by-products of low molecular weight. Formaldehyde, being the most common oxygenated by-product of ozone, is considered to be a problematic compound by the water industry due to its potential adverse health effects. This research attempts to provide specific information on the effects of water quality parameters, specifically, pH and alkalinity, the structure of humic material, and the operational parameters, e.g., ozone dosage and contact time, on generation of formaldehyde.

The results showed that ozonation caused almost an immediate formation of formaldehyde, which reached a peak value, and then started to decrease with continued ozonation. Ozonation of aqueous fulvic acid produced higher concentrations of formaldehyde compared to other types of humic material. Formaldehyde formation was suppressed by high bicarbonate levels, and enhanced at higher pH. Formaldehyde accumulation was more dramatic at low ozone dosages.

Keywords:

Ozone, Formaldehyde, Ozonation, Ozone By-products, Humic Material, Drinking Water