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Abstract Title: Seawater ozonation: effect of natural organic matter

Abstract: Nowadays seawater treatment by oxidation process is becoming a subject of attention due to the development marine industry. In the marine industry such as Ballast water, Aquaculture, Desalination, Aquarium etc., oxidation process is frequently used. The seawater contains various kinds of natural organic matter (NOM). NOM composed of various organic compounds in natural processes such as aquatic organic matter decomposition and algal metabolic reactions.

However, the effect of seawater NOM on oxidation process is not well studied. The seawater background NOM might consume the oxidants, reduce the disinfection efficiency and can be cause of by-product formation. The aim of this study was to evaluate the effect of seawater NOM on oxidation by ozone and bromine. Seawater samples from six locations were collected from Korea peninsula.

The seawater NOM were characterized by Excitation Emission Matrix (EEM) and Liquid Chromatography Organic carbon detector (LC-OCD). In seawater ozonation, ozone decomposition and bromine formation was observed. The main oxidant is bromine because of the rapid reactivity of ozone with bromide ion in seawater. The potential of ozone and bromine for seawater oxidation and the effect of background natural organic matter under the tested seawater was investigated. The oxidation efficiency of the samples collected from six locations was found to be different. The main reason for this might be due the difference in the kinds of NOM. This indicates that, the efficiency of seawater ozonation could be different for various seawater sources.