

Abstract

A Subject of the Chlorine Management at a Thermal Power Plant on the Northwest Pacific Ocean in Japan.

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Power plants using seawater for cooling usually suffer from biofouling. Chlorine is often used to lessen biofouling damages. A monitoring survey of the concentration of chlorine residuals was conducted at the outlet of a large-scale thermal power plant where it has been required by the local government to keep the concentration of chlorine residuals under 0.05mg/L at the outlet. Monthly measurements of chlorine residuals were conducted. The development of red color of DPD reagents were observed even while the chlorination was stopped (it means a background level of chlorine residual). This may cause a difficulty in the effective management of chlorination. The relationship between chlorine residuals and phytoplankton concentrations was studied. In the laboratory, temperature effects on measurements of chlorine residuals (oxidants) were examined using three methods (iodometric titration, Orthotolidine and DPD method).

We found that the background level of chlorine residuals changed seasonally connecting with phytoplankton growth, but did not change depending on the water temperature. We assume that H₂O₂ produced by phytoplankton might be related to the background of chlorine residue.