

速報

バラスト水処理における ナトリウムピリチオン及び二酸化塩素の適用に関する研究

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Abstract

Many techniques are being developed in the world wide to prevent marine organism's transportation with ballast waters of ships. This study was conducted to know the availability of sodium pyriothione (NaPT) and chlorine dioxide (ClO_2) for ballast water treatment.

The concentrations of 3 mg/l and 9 mg/l of NaPT, and 3 mg/l of ClO_2 were prepared with sea water which was taken from Tokyo bay. These were incubated at $20 \pm 1^\circ\text{C}$ and dark for 7 days. After 4 hours of the incubation, the number of heterotrophic bacteria decreased from 2.9×10^5 CFU/ml to 70 CFU/ml in the sea water containing ClO_2 . But more than 2.9×10^5 CFU/ml of heterotrophic bacteria was detected in the all sea waters after 7 days of the incubation. The chlorophyll *a* in the sea water containing ClO_2 was almost disappeared after one day of the incubation.

At 7th day of this study, each 800 ml of the sea water was divided into two groups, and 1.2 mgs of ClO_2 s were added to one group of the sea waters (" ClO_2 additional group" and " ClO_2 non additional group"). These were incubated at $20 \pm 1^\circ\text{C}$ and a 12 hours cycle of light and dark for 43 days. Besides, each 5 ml of the sea water was injected into 100 ml of f/2 mediums to confirm existence of survived phytoplankton after 4 hours of the incubation. The increasing of chlorophyll *a* in the f/2 mediums were observed in both groups of control (only sea water at beginning of this study) and 3 mg/l of ClO_2 on " ClO_2 non additional group". The result of 43 days incubation showed existence of survived phytoplankton in all sea waters, and the lowest cell density of phytoplankton in 3 mg/l of ClO_2 on " ClO_2 additional group".

From these results, although heterotrophic bacteria and phytoplankton were not extinguished by NaPT and ClO_2 under this experimental condition, it seems that ClO_2 is available for ballast water treatment.