

船底塗料(TBT)の代替防汚物質に関する有害性評価の研究

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Abstract

Tributyltin (TBT) is a biocidal chemical that has been used primarily as an antifouling agent incorporated into antifouling paints for vessel hulls. However, TBT was found to affect non-target organisms, which led to the global restriction on its use. As a result, organometallic substances, pesticides and other chemicals have been used as alternatives to TBT. These include zinc pyrithione (ZnPT), copper pyrithione (CuPT), pyridine-triphenylborane (PK), SeaNine211, Diuron (DCMU) and Irgarol 1051.

Although TBT alternatives have been used for ship hulls, fishing nets and other fishing equipment, they have been mainly used as antifouling paints for ship hulls. Antifouling paints are used for commercial vessels, fishing boats and pleasure boats. Taking total areas of ship hulls into account, we considered only commercial vessels as discharge sources of TBT alternatives. As a result of our surveys, it was found that CuPT was the one used on commercial vessels as a TBT alternative.

We conducted literature review on the toxicity of CuPT on aquatic organisms and its uncertainty. As a result, we selected 1.8 μ g/L, which was the lowest acute toxicity, as a criteria toxicity data for risk assessment, and concluded that 100 was appropriate as its uncertainty factor. Ecological risk assessment can be conducted using these toxicity data and uncertainty factor and estimated environmental concentrations of CuPT.