数値モデルによる銅ピリチオン(CuPT)の東京湾における生態リスク評価
－シナリオシミュレーションによるリスク評価の検討－

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Abstract

A risk assessment of Copper Pyrithione (CuPT) in Tokyo Bay was conducted using Margin of Exposure (MOE) method. Sources of CuPT in this study were assumed to be commercial vessels in harbors and navigation routes. Concentrations of CuPT in Tokyo Bay were estimated using three-dimensional hydrodynamic model, ecosystem model and chemical fate prediction model. These models calculate horizontal and vertical distributions of CuPT concentrations with a fine grid scale : 1 km grid and 10 separate layers with a minimum thickness of 2 m. Risk to marine life of Tokyo Bay exists when MOE values are less than Uncertainty Factor (UF). MOEs of Tokyo Bay were estimated with a UF value of 100 using dissolved CuPT concentration resulting from the model. For this scenario, it seemed that the risk exists in the surface layer of harbors, whereas it does not exist in the bottom layer of the whole bay area.

Next, as a numerical experiment, scenario simulations were carried out under two premises : one with a UF value of 1000 and the other with the decreased amount of CuPT fluxes in harbors. For the first scenario, the risk was found to exist in the surface layer of harbors and almost all navigation routes, and besides, even in the bottom layer of harbors. For the second scenario, the sea area with risk was narrowed by decreasing concentration of CuPT in harbors.