

环境工程 地理学

三丁基锡(TBT)法规实施对全球海洋底泥中TBT含量的影响

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摘要 用于船舶防污漆的三丁基锡(TBT)由于对海洋生态系统危害严重而受到不同程度的限制. 本文根据大量文献资料, 分析了各国或地区TBT控制性法规、海洋底泥中TBT的变化趋势以及二者之间的关系. 全球至少有22个国家或地区制定和实施了TBT限制性法规, 其中欧洲占 59.1%, 法规出台的时间集中在1991年之前, 从2008年9月17日起, IMO实行的全面禁止TBT的法规将进入强制执行阶段. 从世界范围来看, 在1986-2006年之间, 海洋底泥中的TBT并没有表现出明显的下降趋势, 相反1990年之后还有所增加. 这主要是由于近几十年来世界航运的快速发展、制定法规的国家有限以及TBT污染的全球化特征所导致的; 从区域范围看, TBT往往需要在法规出台4~5年甚至更长时间才能出现明显下降, 半限制性法规对小型港口TBT的控制有一定效果, 而没有出台法规的国家TBT污染仍在不断恶化. 这主要是由于法规的迟滞效应和底泥TBT的难降解特性所决定的. 预计底泥和水体中TBT含量的有效下降和生态的良好恢复仍需十多年甚至数十年的时间.

关键词 [三丁基锡\(TBT\)](#) [底泥](#) [法规](#) [性畸变](#)

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Effects of implementation of TBT legislation on TBT concentrations in marine sediments all over the world (Chinese)

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Abstract

Tributyltin (TBT) used to be widely used as biocides in antifouling paints, but now has been banned in different degrees due to its harmful effects on marine ecosystems. Based on rich references, this paper analyzed relationship between legislations against TBT and concentrations of TBT in marine sediment. At least 22 countries or areas have legislations against TBT and 59.1% of them are in Europe. Most of the legislations were published before 1991. IMO legislation to ban TBT totally will come into force on September 17, 2008. In the world scale, TBT in sediment did not show significant decrease during 1986 to 2006. In contrast, TBT in sediment was a little higher after 1990s' than before. It was mainly due to the great development of marine transportations, the limited countries with legislation and the global pollution of TBT. As for the areas with registrations against TBT, TBT in sediment usually did not decrease significantly until 4~5 years later. Partial legislation of TBT had positive effect on controlling TBT pollution in small harbors. However, TBT pollution in sediment got worse in those countries without legislation of TBT in recent years. Due to the lag effect of TBT legislation and the slow degradation of TBT in sediment, it will take more decades for TBT concentrations to decrease in sediment and water, and for a ecosystem to recover effectively.

Key words [TBT](#) [sediment](#) [TBT legislations](#) [imposex](#)

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