

## 3种表面活性剂对有机氯农药污染场地土壤的增效洗脱修复效应

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## Effects of Three Surfactants Remedying Organochlorine Polluted Soils Through Enhanced Elution

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摘要

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摘要 以有机氯农药生产企业工业场地污染土壤为对象, 研究Tween80、TritonX-100和SDS这3种表面活性剂对土壤中氯丹( $\alpha$ -氯丹和 $\gamma$ -氯丹)、灭蚊灵、七氯、硫丹( $\alpha$ -硫丹和 $\beta$ -硫丹)的增溶洗脱效应。结果表明, 3种表面活性剂对土壤中有机氯农药均具有一定的增效洗脱作用, 且洗脱去除率随着表面活性剂添加量升高而逐渐增加。3种表面活性剂对土壤中氯丹、硫丹和七氯的去除率明显高于灭蚊灵, TritonX-100对灭蚊灵的去除率明显高于SDS和Tween80。Tween80和TritonX-100添加量为 $10\text{ g}\cdot\text{L}^{-1}$ 、SDS添加量为 $8.50\text{ g}\cdot\text{L}^{-1}$ 时, 对土壤中4类有机氯农药的总去除率最高, 分别为32.8%、59.7%和60.1%。对该类污染场地土壤, 选择 $10\text{ g}\cdot\text{L}^{-1}$  TritonX-100溶液在 $50\text{ }^\circ\text{C}$ 条件下振荡5min时洗脱效果最好。

关键词: 土壤修复 污染场地 表面活性剂 有机氯农药 氯丹 灭蚊灵

Abstract: A batch soil washing experiment was carried out using Tween80, TritonX-100 and SDS, three different kinds of surfactants to elute organochlorine pesticides from contaminated soil. It was found that Tween80, TritonX-100 and SDS all displayed certain effects, which increased with the application rate of the surfactants. Their effects on chlordane, endosulfan and heptachlor were obviously higher than on mirex. The removal effect of TritonX-100 on mirex was significantly higher than that of the other two. Treated with Tween80 at  $10\text{ g}\cdot\text{L}^{-1}$ , Triton X-100 at  $10\text{ g}\cdot\text{L}^{-1}$  and SDS at  $8.50\text{ g}\cdot\text{L}^{-1}$ , the soil reduced its total contamination of the four pesticides by 32.8%, 59.7% and 60.1%, respectively with elevated temperature, the removal rate of OCPs increased. For such contaminated soils, the use of  $10\text{ g}\cdot\text{L}^{-1}$  TritonX-100 was the best after the samples were shaken for 5 minutes at  $50\text{ }^\circ\text{C}$ .

Keywords: soil remediation contaminated site surfactant organochlorine pesticide chlordane mirex

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