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Degradacija organofosfornog insekticida pomoću hlor-dioksida

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U ovom radu je ispitivana degradacija organofosfornog insekticida (malationa) primenom hlor-dioksida. Degradacija je proučavana u dejonizovanoj vodi. Optimizacija uslova degradacije je ispitivana u uslovima svetlosti, sa različitim dozama hlor-dioksida, posle različitih vremenskih perioda degradacije i pri različitim pH vrednostima rastvora. Ovo je prvo istraživanje gde je degradacija malationa ispitivana upotrebom hlor-dioksida kao degradacionog sredstva. Procenat degradacije je određen pomoću HPLC-DAD, dok su degradacioni proizvodi izolovani i indentifikovani pomoću GC/MS. Rezultati su pokazali da pH ima značajan uticaj na stepen degradacije malationa. Ispitivani insekticid pokazuje dobar stepen degradacije. Vrednost stepena degradacije pri optimalnim uslovima za malation je 97,78 % primenom 5 mg/L hlor-dioksida na pH 7,00 posle 24 h tretmana. Analizom masenih spektara malationa utvrđeno je da su dobijeni degradacioni proizvodi: dietil 2-hidroksisukcinat, dietil fumarat, dimetil hidrogen fosfat, dietil 2-((dimetoksifosforil)tio)sukcinat.

Degradation of organophosphorus insecticide by chlorine dioxide

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In this paper, the degradation of organophosphorus insecticide (malathion) with chlorine dioxide was investigated. Degradation was studied in deionized water. Optimization of degradation conditions was examined under light condition, with different doses of chlorine dioxide, after different degradation times and at different pH values. This is the first study where degradation of malathion was done using chlorine dioxide as a degradation agent. The percentage of degradation was determined by HPLC-DAD, while the degradation products were isolated and identified by GC-MS. The results showed that pH has a significant influence on the degree of degradation. The value of degradation degree determined under the optimal conditions for malathion was 97.78 % using 5 mg/L chlorine dioxide at pH 7.00 after 24 h of treatment. By analyzing mass spectra of malathion, it was found that the resulting degradation products were diethyl 2-hydroxysuccinate, diethyl fumarate, dimethyl hydrogen phosphate and diethyl 2-((dimethoxyphosphoryl)thio)succinate.

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