

Adsorption-Desorption Study of Endosulfan Isomers in Agricultural Soil

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Abstract

Endosulfan is a chlorinated pesticide. Technical and market grade Endosulfan is a mixture of two stereo isomers, α - and β -endosulfan in a ratio of 7:3, and may have some fraction of Endosulfan sulfate, Endodiol and Endosulfan ether. However, their main properties are killing or distressing eukaryotic organisms, so they also pose risk to non-target species in the ecosystem. Due to hydrophobicity of Endosulfan isomers and metabolites, these are bio-accumulate and magnify in the ecosystem. Main processes responsible for attenuation of pesticides in the Environment are spray drift, plant uptake, volatilization, surface runoff, adsorption-desorption, leaching, chemical, photochemical and biological degradations. In present study adsorption desorption of Endosulfan isomers were studied.

To understand the fate of Endosulfan in the environment, it is very important know their fate in agricultural soil. In this study adsorption desorption of Endosulfan isomers were done with pure isomers as well as mixture of isomers. Equilibrium of adsorption and desorption of Endosulfan isomers reach within 6 hours. Results show that both isomers α - and β -Endosulfan have different kinetics. β -Endosulfan have faster rate of adsorption as compared to α -Endosulfan. β -Endosulfan is strongly bound to the soil as compared to α -Endosulfan. By the adsorption desorption behaviour of Endosulfan isomers in agriculture soil, we can predict and understand the fate of these isomers of Endosulfan.

Topic area: Environmental Engineering

Keywords: Pollutants, Adsorption-Desorption, Isomers.

