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Environment and water

Optimization of SPME/GC-MS analytical method using Response Surface Methodology for pesticides monitoring in aqueous matrices

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Emerging pollutants are a type of contaminants that can occur in water sources. They can be defined as any synthetic or naturally occurring chemical or microorganism that is not usually monitored or regulated in the environment and have the potential to cause detrimental ecological and human health impacts. These compounds can be found in the environment in very low concentrations, at scales ranging from nanograms to micrograms per liter.[1] Pesticides are an important group of emerging pollutants due to the continuous increase in their use in agricultural production process to control diseases, pests and weeds.[2]

In this work, it will be presented the optimization of solid phase microextraction (SPME), using a response surface methodology (RSM) based on an experimental planification defined using a Box-Behnken Design (BBD). After optimization of the complete analytical methodology (SPME/GC-MS), the method validation is done by monitoring six of the most used pesticides in northeast of Portugal (acetochlor, alachlor, dimethoate, heptachlor, metolachlor and terbuthylazine). The molecular structures of the compounds under study are presented in **Figure 1**. The method is validated through its application using real samples of aqueous matrices collected from different rivers of the region.

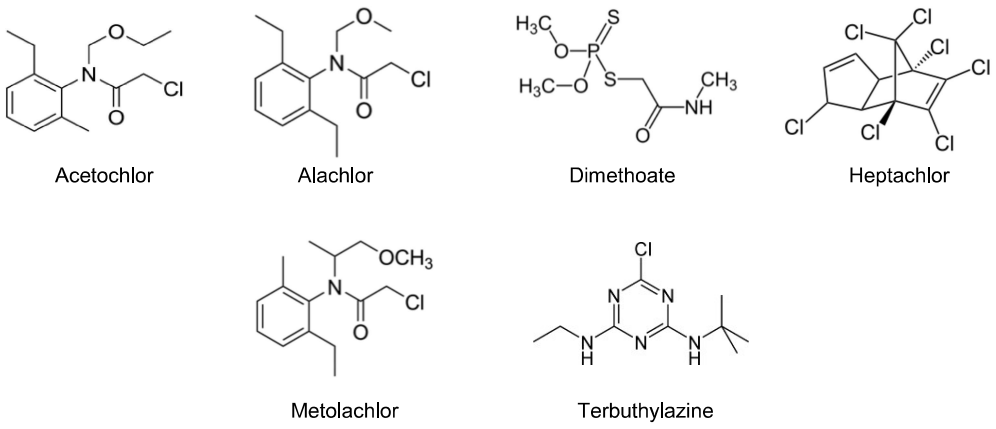

Figure 1: Chemical structures of the studied pesticides.

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