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In situ metathesis reaction combined with liquid-phase microextraction based on the solidification of sedimentary ionic liquids for the determination of pyrethroid insecticides in water samples

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Abstract

A novel dispersion liquid-liquid microextraction method based on the solidification of sedimentary ionic liquids (SSIL-DLLME), in which an in situ metathesis reaction forms an ionic liquid (IL) extraction phase, was developed to determine four pyrethroid insecticides (i.e., permethrin, cyhalothrin, fenprothrin, and transfluthrin) in water followed by separation using high-performance liquid chromatography. In the developed method, in situ DLLME was used to enhance the extraction efficiency and yield. After centrifugation, the extraction solvent, tributyldecylphosphonium hexafluorophosphate ($[P_{44412}][PF_6]$), was easily collected by solidification in the bottom of the tube. The effects of various experimental parameters, the quantity of tributyldecylphosphonium bromide ($[P_{44412}]Br$), the molar ratio of $[P_{44412}]Br$ to

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