

Molecularly imprinted polymer solid-phase extraction for the analysis of organophosphorus pesticides in fruit samples

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Abstract	<p>A new selective material based on molecularly imprinted polymers (MIPs) was prepared and used as solid-phase extraction (SPE) sorbent for sample enrichment of organophosphorus pesticides (OPP) residues prior to high performance liquid chromatography (HPLC). Three OPPs widely used in agriculture (diazinon, quinalphos and chlorpyrifos) were selected as target analytes. Various parameters affecting the extraction efficiency of the imprinted polymers were evaluated to optimize the selective preconcentration of OPPs from water samples. Under the optimized conditions, the developed MIP-SPE method showed excellent linearity in the range of 4-200 $\mu\text{g L}^{-1}$ with coefficient of determination (r^2) > 0.997 and good OPP recoveries of >91% and limits of detection (LODs) ranging from 0.83 $\mu\text{g L}^{-1}$ to 2.8 $\mu\text{g L}^{-1}$, which is much lower than the maximum residue limits (MRLs) set by the Codex Alimentarius Commission and Japan Food Chemical Research Foundation. The developed method was successfully applied to the analysis of OPPs in selected fruit samples. MIP-SPE showed superior extraction efficiency towards the OPPs as compared to non-imprinted polymer solid-phase extraction (NIP-SPE) and commercial C-18-SPE methods. (C) 2013 Elsevier Inc. All rights reserved.</p>
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