

SYNTHESIS OF A MOLECULAR IMPRINTED POLYMER AS AN ABSORBENT FOR SELECTIVE EXTRACTION OF A TRIAZINE HERBICIDE FROM BIOLOGICAL SAMPLES

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Background & Aim: Increasing production and the use of pesticides for agricultural purposes can lead to many environmental and human health risks. Therefore, trace residue analysis and the assessment of their concentration in occupational and environmental samples is highly necessary to estimate human exposure levels. This study was aimed to use a synthesized molecular imprinted polymer (MIP) as a novel and specific absorbent for residue analysis of metribuzin herbicide in biological sample.

Method: The MIP was synthesized by copolymerizing the named pesticide as the template molecule in presence of methacrylic acid and ethylene glycol dimethacrylate as functional and crosslinking monomers, respectively. Afterwards, important parameters affecting the adsorption and recycling process of metribuzin were optimized using synthesized absorbent through the solid phase extraction (SPE) method to demonstrate the ability of the synthesized MIP for selective recognition of analyte of interest from biological sample. All samples were then analysed by high performance liquid chromatography.

Results: According to the obtained results, trace amount of herbicide of interest was successfully determined using synthesized MIP. The optimum amounts of effective parameters on extraction yield were determined as follow: adsorbent amount-13.15 mg, sample pH-3, sample flow rate-1 mL /min, volume of extraction solvent-1.33 mL, flow rate of extraction solvent-3 ml/min, and the amount of acid in the solvent composition-10%. Detection and quantification limits of the method were 0.0119 and 0.0397 ppb, respectively.

Conclusion: The developed method can be used as an optimum sample preparation procedure for selective and sensitive extraction procedure and determination of desired herbicide from biological sample.

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