PREPARATION OF POLY (EGDMA-Matrp) MICROSPHERES AND THEIR APPLICATION FOR SOLID-PHASE EXTRACTION OF ORGANOPHOSPHORUS PESTICIDES IN WATER

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It is well known that pesticides have the potential to prevent and control harmful organisms being a powerful tool to agricultural problems. It has been estimated that around one-third of the crop production would be lost if chemical substances were not applied against pests. Pesticides have also been used in non-agricultural sectors such as wood preservation, disinfection or household uses. In spite of the several advantages, some pesticides can be toxic to humans and animals and their continuous application is causing serious problems of environmental and food contamination [1]. Organophosphates, one of the most frequently used pesticides in Turkish agriculture, are chemicals that easily dissolve in water and have very high acute toxicity [2]. For these reasons, removal and determination of trace amounts (µg/L) organophosphorus pesticides is very important in ground and surface waters.

The aim of our study was to develop an analytical procedure that is useful for the determination of chlorpyrifos-methyl and chlorpyrifos-ethyl pesticides in water using gas chromatography-flame photometric detector (GC-FPD) following enrichment of the analyte with newly synthesised poly (ethylene glycol dimethacrylate-methacyryloyl-amidotryptophan methyl ester) microspheres. The new extraction material was synthesized and characterized by elemental analysis, infrared spectroscopy (FT-IR), X-ray photoelectron spectroscopy (XPS), scanning electron microscope (SEM) techniques. The new developed solid-phase extraction (SPE) method was compared with EPA standard method for the quantitative determination of organophosphorus pesticides in water. Average recoveries of the pesticides were in the range 80–120% with relative standard deviations generally less than 20%.

KEYWORDS: Organophosphorus pesticides, GC-FPD, SPE, water

REFERENCES:

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