SIMPLE SYNTHESIS OF MAGNETIC POLYSTYRENE COMPOSITE FOR THE DISPERSIVE MICRO-SOLID PHASE EXTRACTION OF PARABENS FROM WATER SAMPLES FOLLOWED BY LC–MS/MS DETERMINATION

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One of the promising extraction techniques is dispersive micro-solid phase extraction (D-µ-SPE) and in the last years, numerous efforts have been focused on establishing new coating materials for D-µ-SPE. In this work, we have synthesized a new composite based on the combination of magnetic nanoparticles (MNPs) and polystyrene. Polystyrene is one of the most widely produced polymers, used as protective packaging, containers, lids, bottles and disposable cutlery. In this case, we have employed polystyrene from packaging of vegetables. Recycling of the polymer is in accordance with criteria of sustainable chemistry.
In order to achieve the best composite, different composites were prepared employing 200 mg of MNPs, 5 mL of chloroform and 50, 100, 150 and 200 mg of polystyrene. The results in Figure 1 show that the analytical signal increased by enhancing the amount of polystyrene till 150 mg, and then decreased. Due to the increase of hydrophobicity and carbon content of the composite, the extraction capability of the composite improved by enhancing the amount of polystyrene till 150 mg. The higher amount of polystyrene, resulted to a very hard composite that was not possible to be grinded well. So, the sorbent was not a homogenous solid and resulted to the worse extraction capability and repeatability.

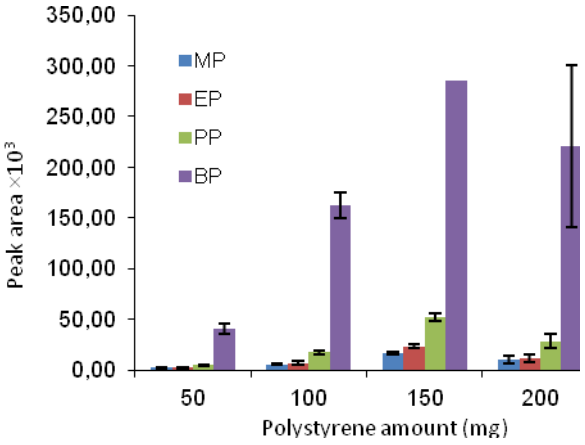

Figure 1. Effect of the polystyrene amount on the extraction capability of the composite.

After optimization of all effective parameters, the method was evaluated in terms of linearity, sensitivity, precision, accuracy and extraction efficiency. The method allowed the determination of parabens with limit of detections in the range from 0.05 to 0.15 ng/mL and good recoveries from 81.2 to 104.5% were obtained in real samples analysis that shows applicability of the new sorbent for the extraction of selected analytes.