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Molecularly imprinted polymer (MIP) membrane assisted direct spray ionization mass spectrometry for agrochemicals screening in foodstuffs

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ABSTRACT

Paper spray ionization (PSI) has some limitations such as low sensitivity and ionization suppression when complex samples are analyzed. The use of sample preparation devices directly coupled to MS can avoid these restrictions. Molecularly imprinted polymers (MIPs) are materials widely used as adsorbent in sample preparation methods such as solid-phase extraction and solid-phase microextraction, and they can provide specific cavities with affinity to a target molecule. Here, we introduce a new MIP membrane spray ionization method combining MIP and PSI. MIP was synthesized directly on a cellulose membrane. Monuron and 2,4,5-T (2,4,5-trichlorophenoxyacetic acid) were used as template molecules in MIP synthesis for diuron and 2,4-D (2,4-dichlorophenoxyacetic acid) analyte sequesters, respectively. Apple, banana and grape methanolic extracts were used as matrices. The MIP membrane spray showed signal intensities of diuron and 2,4-D that were much higher compared to those obtained by non-

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