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Magnetic molecularly imprinted polymers for the selective determination of cocaine by ion mobility spectrometry

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Highlights

- Magnetic molecularly imprinted polymers were prepared for cocaine recognition.
- PEG and 3-(trimethoxysilyl)propyl methacrylate were used for MNPs modification.
- Cocaine were analysed in saliva samples with LOD of 4 μg L^{-1}.
- Results found were statistically comparable to those obtained by LFIA and UPLC-MS.

Abstract

Magnetic molecularly imprinted polymers (MMIPs) were prepared for cocaine recognition by bulk polymerization in the presence of magnetic nanoparticles (MNPs). Two reagents (polyethylene glycol (PEG) and 3-(trimethoxysilyl)propyl methacrylate (V)) were used for MNPs modification. MMIPs were characterized and compared in terms of loading capacity, reusability, accuracy and precision for the extraction of cocaine from saliva samples. It was observed that V-MMIPs gave higher physical stability than PEG-MMIPs. Thus, V-MMIP were used for the analysis of cocaine users saliva. The developed procedure based on ion mobility spectrometry (IMS) provided limits of detection and quantification of 4 and 14 μg L^{-1}, respectively, and recoveries in cocaine free saliva samples spiked at 80, 270 and 560 μg L^{-1} ranging from 80 to 99