



Development of analytical methodologies for multi-residue analysis of drugs in aqueous environmental samples

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Abstract

Over the last decades, there is increasingly growing attention from the scientific community towards the existence of many organic micropollutants in several aqueous samples such as wastewater samples. These of contaminants of emerging concern entering thus the ecosystem through the effluent wastewater.

Recently, for the identification and quantification of the licit and illicit drugs and their metabolites several sensitive analytical methods such as Gas Chromatography coupled with Mass Spectrometry (GS/MS) and Liquid Chromatography tandem Mass spectrometry (LC-MS/MS) have been developed. Beyond the development of the analytical methods which are characterized from high sensitivity and selectivity, another challenge for the scientists is the pretreatment of the difficult samples such as wastewater, which are complex matrices and demand extensive preparation for separation of interfering matrix compounds. For the determination of these contaminants of emerging concern in the low concentration of ng/L, Solid Phase Extraction method (SPE) followed by GC-MS or LC-MS/MS, has been developed and optimized.

The present review presents the development and optimization of several analytical methodologies for the accurate multi-residue determination of multi-class licit and illicit drugs in wastewater samples, using SPE followed by LC-MS/MS, which is considered as a state of the art of the analysis of the micropollutants in the difficult aqueous matrices.

Keywords: pharmaceuticals, LC-MS/MS, wastewater, Solid Phase Extraction (SPE)