MULTIDETERMINATION OF DRUGS OF ABUSE IN HUMAN HAIR USING RESTRICTED ACCESS SUPRAMOLECULAR SOLVENT COMBINED WITH LC-MS/MS.

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Abstract

Multidetermination of drugs of abuse in human hair plays a significant role in forensic science. Traditionally, drugs from hair have been extracted by techniques such as pressurized liquid extraction (PLE) and ultrasonic-assisted extraction (UAE) that require high volumes of organic solvents and are time-consuming. In addition, clean-up steps are required to obtain pure extracts which increases the consumption of organic solvents and costs and time of analysis. In this work, the combination of hexanol-based restricted access supramolecular solvent (SUPRAS-RAM) and liquid chromatography tandem mass spectrometry was used for the determination of 13 drugs of abuse from human hair. Efficient analyte extraction and sample cleanup was simultaneously achieved by vortex-shaking the hair sample with minute volumes of SUPRAS-RAM. The method was validated following the European Commission Decision 2002/657/EC. No signal suppression or enhancement was observed at the selected experimental conditions and quantitative recoveries (86-105 %) were obtained for all analytes. Method detection and quantitation limits were in the range (0.01-0.10 ng/g and 0.10-0.36 ng/g), respectively. The proposed method for sample treatment is simple and quick and meets the requirements of the European Commission decision to be used in real world.

Keywords: Multidetermination, drugs of abuse, restricted access, supramolecular solvent.