



PC.08. Determination of amphetamine-related drugs in hair using MEPS as sample clean-up

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Introduction and aims: Different extraction and clean-up protocols have been used for amphetamine-related compounds determination in hair. Microextraction by packed sorbent (MEPS) is a miniaturized version of solid-phase extraction (SPE) which has been applied to determine a number of drugs in hair (e.g., opiates, cocaine, ketamine, etc.) [1-4]. However, concerning amphetamine-related drugs, MEPS has only been used in hair for the determination of amphetamine (AMP) and methamphetamine (MAMP). The aim of this work was the development and validation of a method to determine AMP, MAMP, MDA, MDMA, MDE and MBDB in hair using MEPS for sample clean-up.

Materials and methods: Hair (50 mg) was incubated with NaOH 1M at 45 °C overnight [5], after which HCl 10M was added for neutralization and the solution was centrifuged. The MEPS procedure for extract clean-up was optimized using the Design of Experiments (DoE) approach, and the final steps were: conditioning (1 x 250 µL of methanol and 1 x 250 µL of deionized water); loading (18 x 100 µL); and elution (7 x 100 µL of 2% NH₄OH in acetonitrile). To the eluted extract, 30 µL of MBTFA was added (to avoid loss of analytes), and extracts were evaporated to dryness, following microwave-assisted derivatization with 50 µL of MBTFA. A gas chromatography coupled to mass spectrometry (GC-MS) system was used for determination.

Results and discussion: The MEPS procedure resulted in recoveries of 8-14% for AMP, 14-20% for MAMP, 10-15% for MDA, 18-28% for MDMA, 25-43% for MDE and 34-52% for MBDB, in the linear range of 0.2-5.0 ng/mg. Precision and



accuracy of the developed method were in accordance with the statements of international guidelines for method validation.

Conclusions: This is the first analytical method using MEPS coupled to GC-MS to determine the selected amphetamines in hair samples, proving to be a great alternative to the classic procedures, being rapid, eco-friendly and less expensive.

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