

Determination of ketamine, methamphetamine and 3,4-methylenedioxymethamphetamine in human hair by flash evaporation-gas chromatography/mass spectrometry

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Abstract:

A rapid and sensitive method utilizing flash evaporation-gas chromatography/mass spectrometry (FE-GC/MS) has been developed. The method is applicable to determine ketamine (KET), methamphetamine (MAMP) and 3,4-methylenedioxymethamphetamine (MDMA) in human hair. Cut and weighted hair (0.30 mg) was heated at the flash evaporation temperature of 350 °C. KET, MAMP and MDMA were released into a capillary column for GC/MS analysis and produced fragment ions in SIM mode. Validation of the method included evaluation of linearity, sensitivity, accuracy, precision and repeatability. Linearity ranged from 2 to 300 ng/mg for KET in hair and 2 to 200 ng/mg for MAMP and MDMA in hair with the correlation coefficients all greater than 0.998. Limits of detection were 0.7 ng/mg and limits of quantification were 2.0 ng/mg of hair for KET, MAMP and MDMA. The precision ranged from 1.57 % to 7.75 % for KET, 1.49 % to 7.10 % for MAMP and 1.84 % to 8.31 % for MDMA. The recovery ranged from 102.1 % to 110.9 % for KET, 99.3 % to 108.0% for MAMP and 89.5 % to 112.6 % for MDMA. Six authentic hair samples from known drug abusers and three drug-free hair samples from volunteers who had never used drugs were successfully analyzed. Compared with traditional time-consuming and hair-consuming pretreatment method, FE-GC/MS was a faster, simpler and low sample consumption method for the determination of KET, MAMP and MDMA in human hair.

* Excerpted from online journal website (Click the title)

Frontier Labs Products used:

Multi-Shot Pyrolyzer (EGA/PY-3030D)