

## **Speeding up the analytical times: fast GC analysis for stimulants, narcotics and drugs of abuse**

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### *Abstract*

A fast GC-MS method has been developed for the improvement of the instrumental method for the determination of stimulants and narcotics excreted free in urine (the “traditional” Screening 1 in most antidoping laboratories).

The method allows the simultaneous determination of 52 stimulants and narcotics by gas chromatography-mass spectrometry. The procedure involves the liquid/liquid extraction of the analytes from urine at strong alkaline pH and the injection of the extract in GC-MS with a fast GC column (10 m x 0.18 mm i.d); the short column allows the complete separation of the 52 analytes in a chromatographic run of 8 minutes. At the same time, we developed a method for the determination of other drugs of abuse that require a prior derivatisation step, such as benzoylecgonine and of the narcotics and other drugs excreted conjugated (THC-COOH, heroin metabolites, buprenorphine). This further method involves the hydrolysis of glucuronides and derivatisation of the extracts to obtain TMS derivatives. The GC-MS analysis is performed with the same fast GC column as above, allowing the determination of various drugs of abuse in a total time of 6 minutes. The methods have been fully validated giving Lower Limits of Detection (LLODs) satisfactory for their application to antidoping analysis (lower than the WADA MRPL) as well as to forensic toxicology. The combination of both methods allows the determination of the majority of stimulants, narcotics and drugs of abuse of forensic toxicology interest with short analytical times.

The results of the study are published in:

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