

TDTS 45

Detection of trace levels of drugs in dust by TD-GC/MS

Introduction

Forensic detection of proscribed (banned) substances such as heroin or cocaine requires analysis of real-world samples, such as household dust. Direct thermal desorption of materials like this can provide a simple and sensitive approach to drug analysis, and facilitates rapid screening of a broad spectrum of compounds.

In this Application Note we demonstrate the successful detection of trace levels of several drugs of abuse in a sample of household dust.

Experimental

TD (UNITY):

Tubes: Fritted glass with quartz wool
 Tube desorption: 150 °C for 10 min
 Desorption flow: 50 mL/min (no split)
 Flow path: 210 °C
 Focusing trap: High boilers trap
 Trapping temp.: 5 °C
 Trap desorption: 360 °C for 8 min, split flow 10 mL/min
 Carrier gas: He, 30 psi, EPC-controlled

GC/MS:

Column: 30 m × 0.25 mm × 0.25 µm DB-XLB
 Oven: 20 °C (5 min), 20 °C/min to 160 °C, 10 °C/min to 325 °C, 25 °C/min to 340 °C (5 min)

Results

The direct desorption of the sample confirmed the presence of a number of drugs of abuse and related compounds (Figure 1). These included heroin, cocaine, monoacetylmorphine, acetyl codeine and phenobarbital.

Direct desorption of an empty tube immediately after the sample run showed negligible sample carryover (Figure 2), demonstrating efficient desorption through the UNITY TD system.

Trademarks

UNITY™ is a trademark of Markes International Ltd, UK.

Applications were performed under the stated analytical conditions. Operation under different conditions, or with incompatible sample matrices, may impact the performance shown.

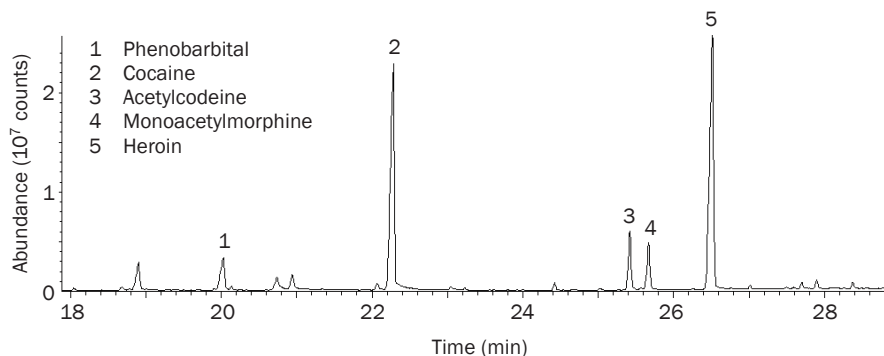


Figure 1: Detection of drugs of abuse in a sample of household dust by direct desorption.

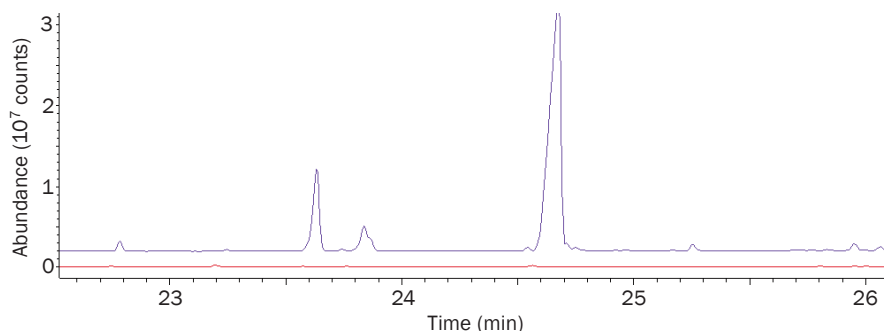


Figure 2: Expanded section of chromatogram showing level of carryover in a system blank run (red trace) immediately after drug desorption.