

# Drug screening using Gas Chromatography/Mass Spectrometry

## Introduction

Drug screening technology has improved greatly in recent years. It is possible to determine drug presence and levels in urine as well as in blood and other body fluids. This application demonstrates the ability of the PerkinElmer Gas Chromatograph/Mass Spectrometer (GC/MS) system to perform these types of analyses.

## Methodology

A PerkinElmer GC/MS system consists of a Gas Chromatograph with integral autosampler combined with a Mass Spectrometer (MS). The GC features full programmable pneumatic control, high-throughput autosampler and the unmatched reliability of a mature gas chromatograph. The PerkinElmer gas chromatograph is user-friendly and easy to maintain. When coupled with a MS, consisting of state-of-the-art

quadrupole design and easy-to-use Windows NT<sup>®</sup>-based software, all parameters for both the GC and MS are under a single point of control.

For the example chromatograms, an Elite Series PE-5 column was coupled to a programmable split/splitless (PSS) injector.

A standard test mix, obtained from Alltech (part number 01463), was injected, and the GC was programmed to elute the compounds in the order shown. The GC and MS conditions are shown in Table 1. A full MS scan of the chromatogram is shown in Figure 1.

**Table 1. Conditions**

PerkinElmer Gas Chromatograph	
Column	Elite Series PE-5 (5% phenyl, methylpolysiloxane) 30 meter by 0.25 mm x 0.25 µm film thickness
Injector temperature	PSS at 200 °C
Oven temperature	75 °C for 1 min, 10 °C/min to 275 °C
Column flow	1.5 mL/min
Injection volume	1.0 µL
TurboMass Mass Spectrometer	
Mass scan range	45 to 400 Da
Scan speed	0.25 sec
Scan mode	Full scan
Ion source temperature	200 °C
Transfer line temperature	200 °C

## Results

The TurboMass MS system shows good library searches of the peaks of interest (see Figure 2). The extremely reliable autosampler coupled to the high performance of the PerkinElmer MS provides for a robust, high-throughput system to meet the needs of the drug testing laboratory.

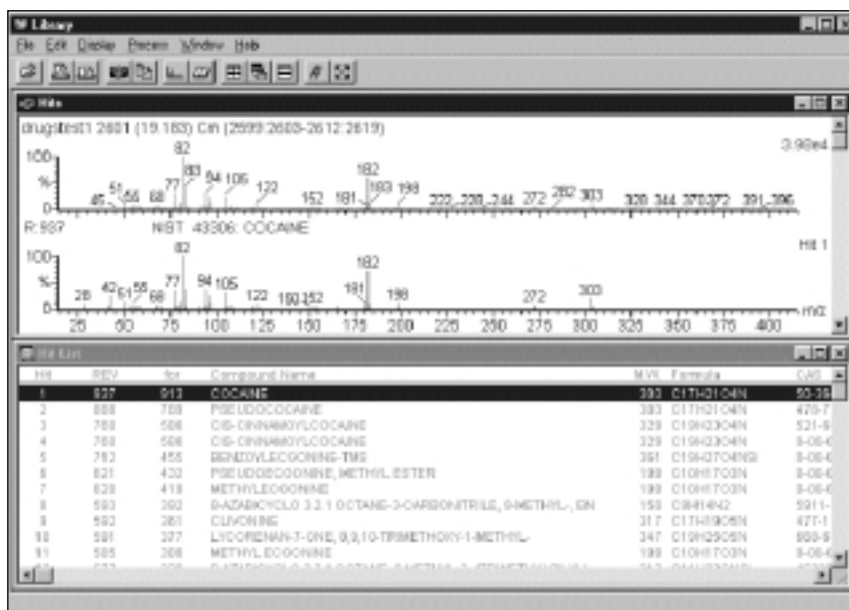


Figure 2. Library search for the cocaine peak.

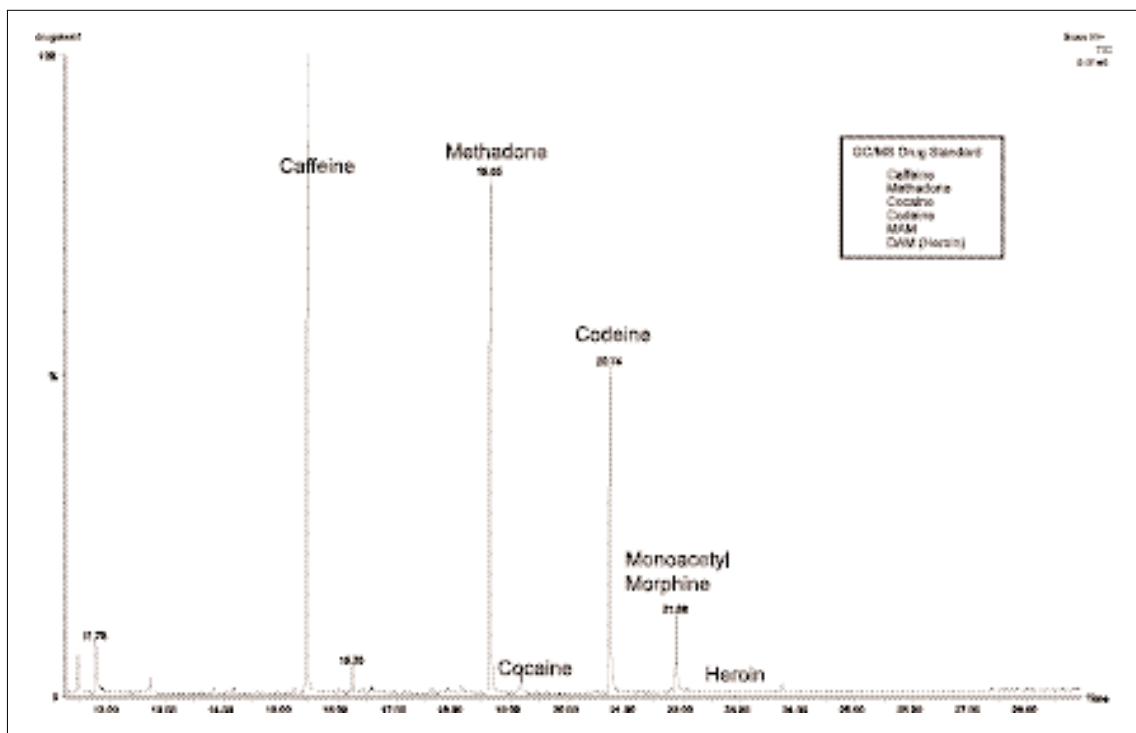


Figure 1. Chromatogram of drug standard.

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