Determination of Heroin, Morphine, Codeine And 6-Acetyl Morphine In Seized Drug Samples By GC-FID and Its Analytical Method Validation

Oya T. YETER¹, Nilay DERMAN¹, Soner CUBUK²

¹The Council of Forensic Medicine, Department of Chemistry, Istanbul-TURKEY.
²Marmara University, Faculty of Art and Science, Department of Chemistry, 34722 Goztepe / Istanbul- TURKEY

Drug abuse is a serious international problem and is on the increase [1]. Heroin is still one of the most frequently abused drugs of today [2]. All over the world, law enforcement agencies try to eradicate the illicit production and trafficking of this potent and highly addictive narcotic. To this aim, important information is provided by physical and chemical analysis of confiscated samples, with special attention for the identification and the quantification of active components.

The present study deals with the quantification of active constituents (heroin, morphine, codeine and 6-acetyl morphine) and identification of adulterants such as caffeine, quinine, paracetamol, phenobarbital, diazepam present in the seized samples. Major alkaloid and adulterant data can also provide important information about determination of origin seized samples. Especially South-East Asian heroin samples can, with reasonable certainty, be distinguished from those samples originating elsewhere simply by comparison of major alkaloid analyses [3].

In this study, simple, rapid and reliable analytical method was developed. Samples were analysed by GC-FID without extraction and derivatization. Analytical method validation tests were performed and measurement uncertainty were calculated.

The method is linear over the range (0.01-2mg mL⁻¹) for heroin, codeine, 6-acetyl morphine and (0.05-1.5mg mL⁻¹) for morphine. Correlation coefficients vary between 0.998 for morphine and 0.999 for heroin, codeine, 6-acetyl morphine. Limits of detection (LoDs) vary between 0.01-0.05mg mL⁻¹ and limits of quantitation (LoQs) vary between 0.03-0.08mg mL⁻¹. Accuracies of the four analytes were in the range of 81.76-99.25% (heroin), 94.80-96.45% (morphine), 81.15-100.50% (codeine) and 96.55-101.26% 6-acetyl morphine at both spiking low and high levels. Relative standard deviations (RSDs) were less than 10% for all of the accuracy tests.

References