

# The Application of Chemical Derivatization in Forensic Drug Chemistry for Gas and High-Performance Liquid Chromatographic Methods of Analysis

**REFERENCE:** Moore JM: The application of chemical derivatization in forensic drug chemistry for gas and high-performance liquid chromatographic methods of analysis; *Forensic Sci Rev* 2:79–124; 1990.

**ABSTRACT:** The analyses of solid-dosage forensic drug samples can be enhanced by chemical derivatization followed by gas chromatography or high-performance liquid chromatography. Using these techniques permits improved detection and chromatography of some illicit drugs and their manufacturing by-products. This review focuses on the use of chemical derivatization in conjunction with gas chromatography-flame ionization detection, gas chromatography-electron capture detection, gas chromatography-mass spectrometry, high-performance liquid chromatography-ultraviolet detection and high-performance liquid chromatography-fluorescence detection in the analysis of illicit drug samples. These drugs include the amphetamines, barbiturates, cannabis, fentanyl, opium, and hallucinogens. Discussion on sensitivity enhancement and determination of enantiomeric composition using gas chromatography and high-performance liquid chromatography is included. An entire section is devoted to the chemical derivatization and chromatographic analyses of manufacturing by-products found in illicit amphetamine and methamphetamine, heroin, and cocaine samples. This review also includes a section that describes practical elements and experimental design associated with chemical derivatization-chromatographic analyses.

**KEY WORDS:** Amphetamines, barbiturates, *cannabis*, capillary gas chromatography, cocaine, derivatization, electron-capture detection, fentanyl, flame ionization detection, fluorescence detection, forensic drug chemistry, hallucinogens, heroin, high-performance liquid chromatography, illicit drugs, manufacturing by-products, ultraviolet detection.