



W26 Overcoming Analytical Challenges Inherent in New Psychoactive Substances With Gas Chromatography Coupled With Vapor Phase Infrared Detection (GC-IRD)

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Learning Overview: The goals of this presentation are to obtain: (1) a more comprehensive awareness and understanding of the analytical challenges inherent in the analysis of novel and emerging drugs; (2) an overview and better understanding of the role of GC-IRD applications in the analysis of seized drugs; and (3) knowledge and tools for the optimization of GC-IRD methodology for the analysis of opioids, synthetic cathinones, and synthetic cannabinoids.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by informing attendees that GC-IRD is a useful alternative for the rapid detection and identification of novel substances when routine analytical techniques yield limited information.

After attending this session, participants will gain comprehensive knowledge and understanding on the unprecedented analytical challenges associated with the influx of novel psychoactive substances in the illicit market during the past several years. Synthetic substances, such as synthetic cannabinoids, opioids, and synthetic cathinones, continue to be illicitly manipulated to create more and new substances of equal or greater toxicity and potency.

With the emergence of these novel compounds, forensic crime laboratories are facing analytical challenges for the reliable detection and identification of these substances. Due to their structural similarities, routine analytical methodology (e.g., gas chromatography/mass spectrometry) is often not sufficient. To increase the complexity of the problem, a large number of seized drug evidence is now poly-drug, creating another challenge in the separation of these substances. Laboratories have had to explore other options to increase their scientific capabilities.

Forensic scientists are frequently finding themselves turning to GC-IRD as a suitable alternative to routine instrumental techniques. Understanding the theory and application of GC-IRD methods for the analysis of seized drugs will assist forensic scientists in better addressing the analytical challenges that are inherent with today's emerging psychoactive substances. Many of these substances generate the same or significantly similar mass spectra, present co-elution problems, or may have associated thermally degradable concerns.

While the technology of GC-IRD is not new, its application to the forensic analysis of seized drugs continues to increase. Attendees will be introduced to the most current analytical challenges associated with seized drugs analysis and will be introduced to GC-IRD background and theory. Attendees will learn how to optimize GC-IRD methods and apply them to overcome existing challenges associated with synthetic cannabinoids, opioids (specifically, fentanyl-related substances), and synthetic cathinones. Attendees will also learn how modern technological advances can be utilized for even complex mixtures, such as the volume programmable temperature vaporization inlet and light pipe temperature options.

An overview of the role of GC-IRD in forensic laboratories will be provided, and how its applications are increasing their capabilities and making them better equipped to address our nation's opioid crisis and influx of novel and unknown substances.

GC-IRD, Psychoactive Substances, Opioids