



A134 Analysis of Portable Infrared Technology for the Identification of Solid Drug Samples

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After attending this presentation, attendees will understand the potential of handheld, portable infrared spectrometers in identifying and quantifying illicit drugs within a mixture.

This presentation will impact the forensic science community by evaluating the use of portable infrared instrumentation for faster, less expensive, and more efficient ways of identifying illicit drugs that could result in the reduction of laboratory backlogs.

The analysis and identification of illicit drugs constitutes the majority of casework performed in most forensic laboratories. This research evaluates the use of portable infrared spectrometers for the identification of suspected illicit drugs at crime scenes as a replacement for, or in addition to, the use of presumptive color tests. This has the potential to reduce the number of cases submitted to the controlled substance department of forensic laboratories. The recommendations by the Scientific Working Group for the Analysis of Seized Drugs (SWGDRUG) detail the combination of techniques that can be used for drug identification. When a Category A confirmatory method (such as infrared spectroscopy) is combined with a Category B or C method (such as a color test), then a drug can be positively identified. With the development of portable infrared spectrometers with sophisticated library search algorithms, this SWGDRUG protocol can be completed at the crime scene.

Using a portable infrared spectrometer as a tool for on-scene illicit drug identification is advantageous because it is reliable, easy to use, non-destructive, accomplishes analyses quickly, and creates a reviewable record of the results. New portable infrared instruments are small, lightweight, and can be safely and easily operated in extreme conditions such as could be encountered in clandestine drug laboratories or similar scenes. These portable infrared spectrometers utilize diamond Attenuated Total Reflection (d-ATR) sampling, thus no sample preparation is required beyond ensuring contact with the internal reflection element. Further, portable infrared spectrometers are equipped with sophisticated search algorithms that are specifically designed to determine if a sample is a mixture, and, if so, can identify and potentially quantify up to three mixture components. Additionally, these instruments are equipped with technology that enables the infrared data to be wirelessly transmitted to a computer command center for a permanent record of the data and more in-depth spectral analysis. In this research, several pure illicit drug samples, specifically cocaine, methamphetamine, MDMA, and heroin, along with two- and three-component mixtures of these drugs, were analyzed with a portable infrared spectrometer to evaluate its use for the identification of illicit drugs and also for the quantification of illicit drug mixtures. Several samples of drugs commonly known as bath salts were also analyzed.

Infrared Spectroscopy, Controlled Substances, Drug Mixtures