K47 Validation of a Headspace-Gas Chromatography Method for the Analysis of Gamma-Hydroxybutyrate and Analogs

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After attending this presentation, attendees will have learned about the validation of a quantitative technique for the simultaneous analysis of GHB and GHV in beverages using an instrument common to toxicological analyses.

This presentation will impact the forensic community and/or humanity by demonstrating a quantitative technique for the detection of GHB and GHV in beverages using a common toxicological analysis.

Previous work from this laboratory has described validated headspace-gas chromatography-flame ionization (HS-GC-FID) and gas chromatography-mass spectrometry (GC-MS) method for screening and identifying gamma-hydroxybutyrate (GHB) and its lactone (gamma- butyrolactone, GBL) in biological fluids. An advantage of this approach is the use of the same analytical system as blood alcohol measurements; making this method readily available to toxicology laboratories. No sample preparation is required and the use of internal standards facilitates reliable quantitation.

Extensions of this method to other sample matrices and other target compounds will be presented. An analog of GHB, the five carbon gamma-hydroxyvalerate (GHV) and corresponding lactone (gamma- valerolactone GVL) have recently emerged as a predator drug threat. These analogs are characterized by larger dose requirements and thus greater potential for toxicity. Because of their chemical similarity to GHB/GBL, they are also amenable to this method. Results and method validation for these compounds will be discussed and compared to traditional GC-MS analyses. In addition, analysis of typical precursors and by-products will be addressed.

Headspace methods are also useful for physical evidence such as adulterated beverages. Given discrimination based on volatility and solubility, the headspace method effectively removes much of the interfering matrix while affording quantitative transfer of analytes to the analytical system. Results from the analysis of various beverages such as wine, beer, soda, and mixed drinks will be described with recoveries and interferents.

Headspace, GHB, GHV

 ** Presenting Author*