## B114 Optimal Headspace Extraction for the Detection of Volatile Organic Compounds (VOCs) Released From Synthetic Cathinones Using Solid-Phase Microextraction (SPME) for Field Application

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After attending this presentation, attendees will better understand the headspace analysis of synthetic cathinones. This presentation will provide detailed information regarding the volatile organic compounds associated with these drugs.

This presentation will impact the forensic science community by presenting a detailed method to sample synthetic cathinones in a non-destructive manner and by introducing a precise, safe, volatile compound in the form of a Controlled Odor Mimic Permeation System (COMPS), which will equip canine teams with the ability to detect synthetic cathinones (bath salts) currently being smuggled across United States borders. Because of an inadequate knowledge of the volatiles of these bath salts, narcotic detection canines have been unable to detect these illicit substances.

Methylone, ethylone, Methylenedioxypyrovalerone (MDPV), and α-Pyrrolidinopentiophenone (α-PVP, also known as Flakka), collectively referred to as bath salts, are a new trend of illicit substances known as synthetic cathinones. Designed by chemically modifying the core structure of the compound cathinone (the natural amphetamine of the khat plant), synthetic cathinones became prevalent within the United States in the mid-2000s. As an inexpensive and less-controlled alternative to the traditional Methylenedioxymethamphetamine (MDMA, Ecstasy), it has become heavily abused, prompting emergency scheduling by federal regulators. As a result of the drastic increase in popularity and abuse of synthetic cathinones, research studies have been conducted to gain a deeper understanding of its toxicological effects; however, the analytical components (sampling and analysis) required to understand and characterize bath salts are still vastly underrepresented.

This study will present results for an optimal extraction method that has been developed, which can be applied to the indirect analysis of synthetic cathinones. Method development was conducted using a headspace SPME technique on an actual confiscated bath salt sample known as Methylone (Molly). After performing extraction optimization, it was determined that a Polydimethylsiloxane Divinylbenzene (PDMS/DVB) -coated fiber, in addition to complimentary ionization techniques, resulted in the most beneficial set for the extraction and analysis of synthetic cathinone volatile components. This method allows for cathinone derivative samples to be rapidly sampled by non-invasive means, followed by analysis utilizing traditional gas chromatography/mass spectrometry. Determination of the VOCs comprised in these drugs can be beneficial in the creation of an effective canine training aid utilizing the Controlled Odor Mimic Permeation System (COMPS). COMPS involves a deployable source housing a target odor in a permeable polymer, which releases the odor at a known and controlled rate. This controlled system will aid canine teams throughout the country in the detection of synthetic cathinones, a task that a large number of canine teams are currently unable to achieve.

**Synthetic Cathinone, SPME, COMPS**

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