

B117 The Stability of Select Synthetic Cathinones in Non-Alcoholic Beverages

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After attending this presentation, attendees will better understand the role of synthetic cathinones in today's drug-facilitated sexual assaults and how various matrices and storage temperatures can affect the stability of specific synthetic cathinones.

This presentation will impact the forensic science community by offering information on the stability of select synthetic cathinones in beverages, an area of cathinones that has been investigated insufficiently. Through presenting this stability research, samples from suspected spiked drinks can be accurately analyzed and properly stored to aid in the investigation of drug-facilitated sexual assault cases.

Cathinone is a beta-ketone amphetamine found in the leaves of the khat plant (*Catha edulis*). While cathinone is a Schedule I drug, many of its derivatives continue to be unscheduled and referred to as new psychoactive substances. These cathinones can cause euphoria, tachycardia, paranoia, increased sex drive, and lowered inhibitions. It is for these reasons that synthetic cathinones can be used as aids in Drug-Facilitated Sexual Assault (DFSA). When combined with alcohol, synthetic cathinones can lead to an ideal situation for someone to be taken advantage of. These drugs have been seen in recent studies of sexual assault, and their prevalence in the United States has increased over the past ten years. Since synthetic cathinones are becoming a more regular part of forensic casework, exploring the stability of these drugs in different matrices is crucial. Knowing the stability of synthetic cathinones can assist in choosing appropriate storage after seizure to ensure accuracy at the time of testing. This research investigates the stability of naphyrone, alpha-Pyrrolidinopentiophenone (a-PVP), and Methylenedioxypyrovalerone (MDPV) in tap water and Coca-Cola® under different storage conditions throughout a one-month period.

The stability of these three drugs was evaluated based on the matrix, the storage temperature, and the extraction day. Each beverage was spiked at 1mg/L and stored in 1mL individual aliquots at room temperature, 4°C (refrigerator), and -20°C (freezer), all in the absence of light. Aliquots from each storage temperature and matrix were extracted using Clean Screen® DAU cartridges on days 0, 3, 7, 14, and 30 to evaluate how stable each drug was in the matrices at each temperature. Analysis of these extractions was conducted via Gas Chromatography/Mass Spectrometry (GC/MS) in full scan mode.

Naphyrone appears to be stable in both matrices at all temperatures, with no significant drug loss during the 30 days; however, a-PVP was not stable in water at room temperature. By day 14, most of the drug had degraded; however, in the refrigerator and freezer, a-PVP remained mostly stable. Coca-Cola® spiked with a-PVP and MDPV in both water and Coca-Cola® all followed the same trend of room temperature being the least-stable storage condition.

A study comparing the efficiency and recovery of synthetic cathinone extractions using solid phase extraction, Quick, Easy, Cheap, Effective, Rugged, and Safe (QuEChERS), and Filter And Shoot (FASt) extractions was also completed, but by using Liquid Chromatography/Mass Spectrometry/Mass Spectrometry (LC/MS/MS). Comparable results were observed for all drugs.

Synthetic Cathinones, Stability, DFSA