



### **K34 Comprehensive Toxicological Examination in a Case Involving Alleged Use of Bath Salts: The Importance of a Negative Result**

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After attending this presentation, attendees will be able to define the appropriate scope of testing for alleged "Bath Salts" intoxication cases, and appreciate that negative toxicology findings can only be properly interpreted when the scope of testing is understood.

This presentation will impact the forensic science community by providing an approach to rule out drug intoxication with emerging hallucinogenic drugs as part of a complex death investigation. It will also emphasize for the public and the press the importance of waiting for completion of toxicological testing before making assumptions about the role for intoxicants in criminal or death investigations.

In the assessment of crimes of extreme violence or where there is evidence of delusional or psychotic behavior, increasingly suspicion falls on the possible role of emerging designer stimulants and hallucinogens. Similar behaviors, however, can result from mental illness, schizophrenia, or even intoxication with traditional recreational drugs or drugs of abuse.

The importance of a structured escalating set of analytical protocols for these types of investigations cannot be overstated. Once routine toxicological analysis rules out traditional recreation drugs of abuse, the routine testing can begin. A recent case involving a violent assault provides a good example of how the application of routine tests can be supplemented by tests for additional drugs relevant to the fact pattern of the investigation.

In this case, routine drug testing did not reveal the presence of any drug which could explain the extremely violent nature of the attack. Further testing was needed. Additional testing for the common "bath salts" compounds, MDPV, mephedrone and methylene, was performed. In addition a comprehensive screen for a wide variety of both traditional and emerging stimulant and hallucinatory drugs (67 in total) was performed using Liquid Chromatography-Time Of Flight-Mass Spectrometry (LC-TOF/MS). This included tryptamines, designer phenethylamines, other stimulants, cathinones, traditional stimulant drugs including cocaine and its metabolites and amphetamines, methoxy derivatives of phenethylamines, LSD, mescaline, psilocin, and bufotenin. Additional gas chromatography-mass spectrometric analysis was performed and compared to additional libraries containing over 10,000 known designer drugs and their analogs. The chromatographic data were further scrutinized for the presence of unidentified peaks; however, none were found.

Further testing for a comprehensive scope of emerging synthetic cannabinoid compounds was performed also. These drugs have been linked to adverse effects including paranoia, anxiety, psychosis, and violent assaults. A total of 20 synthetic cannabinoid drugs were tested for, including JWH-018, JWH-073, JWH-250, AM-2201, JWH-200, RCS-4, JWH-210, AM-694, JWH-122, JWH-081, JWH-019, RCS-8, JWH-203, JWH-022, JWH-018 5-chloropentyl, UR-144, XLR-11, AM-2233, AM-1248, and A-796,260. None were detected in the blood samples from the case.

Some of these emerging designer drugs, especially in the 2C series and derivatives of MDPV, as well as traditional hallucinogens like LSD and psilocin, are known to have limited stability in biological fluids, so appropriate collection and storage conditions are important in investigation of some of these more labile compounds. Consequently, their use cannot be ruled out even when toxicological tests are negative, and this places more of a burden on the results from a thorough investigation of the scene and history and circumstantial evidence of drug residue and paraphernalia when they exist.

In this case, comprehensive testing of available blood samples starting with routine analytical tests, and the addition of more specialized tests targeted to the compounds of concern, showed the presence of no drugs. No physical evidence from the scene or from the history revealed the presence of specific esoteric drugs that might have been ingested. The reasonable conclusion when the history, scene, autopsy, and toxicological evidence is considered in this case is that designer drug use was not a factor in this case.

**Bath Salts, Designer Drugs, Drugs of Abuse**