K7 The Rapid Identification of Synthetic Hallucinogens 25I-NBOMe and 2C-B Using DART®-MS

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After attending this presentation, attendees will be able to utilize the method presented in order to rapidly identify synthetic hallucinogens.

This presentation will impact the forensic science community by providing a quick screening method using direct analysis in real time AccuTOF™ Mass Spectrometry (DART®-MS) for the analysis of synthetic hallucinogens. This presentation provides a means to identify these compounds found on blotter paper and as a powder.

Synthetic hallucinogens, such as Alexander Shulgin's series of ring substituted methoxyphenethylamines (2-C) and the relatively new dimethoxyphenyl-N-[(2-methoxyphenyl) methyl]-ethanamine (NBOMe) derivatives, have recently become available via the internet. These designer drugs are potent serotonin 5-HT_{2A} receptor agonists. This receptor is linked to certain cognitive processes and other complex behaviors, including working memory, and is responsible for the hallucinogenic effects caused by drugs such as Lysergic Acid Diethylamide (LSD). Numerous 2-C and NBOMe derivatives are available. These drugs are currently sold as "research chemicals" in powder form or on blotter paper. This study presents two cases of the rapid identification by DART®-MS of NBOMe and 2-C derivatives on blotter paper and a "research chemical" in an unmarked capsule, respectively.

Methods: The blotter paper was analyzed by the DART®-MS as both the blotter paper and as a methanol extract. The white powder sample was analyzed directly using the DART®-MS. The DART®-MS was operated in positive-ion mode and controlled by Mass Center software version 1.3.4 m. The ion source had the helium gas flow rate at 2.0L/min, gas heater temperature of 300°C, discharge electrode needle at 4,000V, electrode 1 was set at 150V, and electrode 2 at 250V. The resolving power of the mass spectrometer was 6,000 Full Width at Half Maximum (FWHM). Measurements were taken with the ion guide peak voltage of 800V, reflectron voltage of 900V, orifice 1 was operated at 300°C in function switching mode (20V, 60V, and 90V) with orifice 2 set at 5V and the ring lens set at 3V. The measured mass range was from 40Da to 1,100Da. Accuracy of the data was evaluated by a mass difference of ±5mmu. Polyethylene glycol 600 served as primary reference material for exact mass measurements in each data acquisition set. The 20V DART®-MS spectra of the samples were used to identify the NBOMe and 2-C derivatives.

Results: The blotter paper was determined to contain both 25I-NBOMe and N-(2-methoxybenzyl)-2, 5-dimethoxy-4-chlorophenethylamine (25C-NBOMe) as the major components and smaller amounts of NBOMe derivatives including 2-(4-chloro-2,5-dimethoxyphenyl)-N-[(2-methoxyphenyl)methyl] ethanamine (25C-NBOMe), 2-(2, 5-dimethoxyphenyl)-N-(2-methoxybenzylidene) ethanamine (25H-NBOMe), 25I-MBOMe-Imine, and 25H-NBOMe-Imine. The "research chemical" was determined to contain 4-bromo-2, 5-dimethoxyphenethylamine (2C-B).

Conclusion: Given the efficacy and ease of synthesis of these types of synthetic hallucinogens, it is possible that the abuse of these drugs will continue. DART®-MS was found to be a rapid screening method for the accurate identification of synthetic hallucinogens on both blotter paper and in powder form with little to no sample preparation.

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DART®-MS, 25I-NBOME, 2C-B

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