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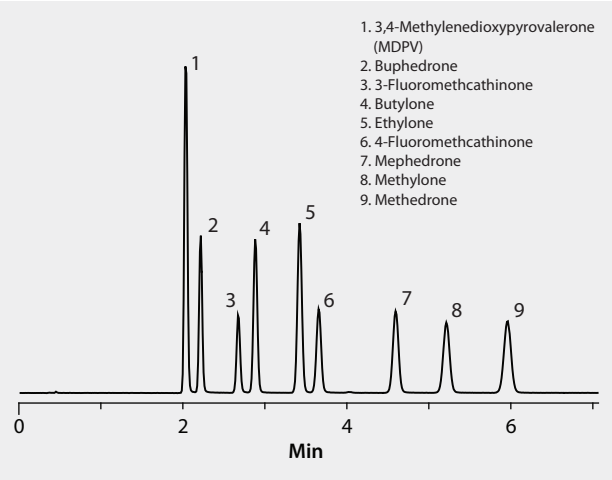
LC/MS (TOF) Analysis of Illicit Bath Salts on Ascentis® Express 2.7 µm HILIC

With the rapid development of unregulated designer and synthetic compounds, the field of illicit drug testing has recently been met with a changing environment. Of most concern has been the development of a class of phenethylamine and cathinone compounds being marketed as "bath salts," "jewelry cleaner," or "plant food." Though sold as "not for human consumption," these compounds are reported to generate stimulating affects similar to that of methamphetamine, heroin, and 3,4- methylenedioxypyrovalerone (MDMA). For a period of time, these compounds could be acquired legally through the internet and head shops due to no direct legal control. In the US, both state and local governments have instituted bans on the sale of these bath salt compounds. Forensic testing facilities often experience difficulty in testing these compounds due to the fact that they are not detected under normal ELISA testing methods; additional more specific LC-MS methods are necessary. The challenge for LC-MS detection of these particular bath salts resides in three sets of isobaric compounds that require chromatographic resolution for positive confirmation. For example, both butylone and ethylone have the same mono isotopic mass, making these compounds indistinguishable, even when using accurate mass time of flight TOF-MS. Efficient chromatographic separation is necessary for accurate quantitation of these compounds. The polar basic nature of the bath salts makes these compounds difficult to retain on traditional reversed-phase C18 and even polar embedded stationary phases, making them prime subjects for HILIC chromatographic separation. Shown here is the fast, high-resolution separation of nine synthetic bath salts on Ascentis Express HILIC.

market focus	Forensics and Toxicology
column	Ascentis Express HILIC, 10 cm x 2.1 mm I.D., 2.7 µm particles (53939-U)
mobile phase	[A] acetonitrile; [B] 0.25 M ammonium formate; (98:2, A:B); premixed
flow rate	0.6 mL/min
pressure	1842 psi (127 bar)
column temp.	35 °C
detector	MS, ESI(+), TIC, m/z 100-1000
injection	1 µL
sample	200 µg/L ea. in acetonitrile
Application No.	G005537



Components

3,4-Methylenedioxypyrovalerone HCl (MDPV) solution (Cerilliant M-146)
Buphedrone hydrochloride solution (Cerilliant B-047)
3-Fluoromethcathinone hydrochloride solution (Cerilliant F-016)
Butylone hydrochloride solution (Cerilliant B-045)
Ethylone hydrochloride (Cerilliant E-071)
Mephedrone hydrochloride solution (Cerilliant M-138)
Methedrone hydrochloride solution (Cerilliant M-147)
4-Fluoromethcathinone hydrochloride solution (Cerilliant F-015)
Methylone hydrochloride (Cerilliant M-140)

Related Products

analytical column
Ascentis® Express HILIC, 2.7 Micron HPLC Column (Supelco 53939-U)
eluent
Acetonitrile (Fluka 14261)
Ammonium formate (Fluka 14266)
Water (Fluka 14263)
standard
Buphedrone hydrochloride solution (Cerilliant B-047)
Butylone hydrochloride solution (Cerilliant B-045)
Ethylone hydrochloride (Cerilliant E-071)
3-Fluoromethcathinone hydrochloride solution (Cerilliant F-016)
4-Fluoromethcathinone hydrochloride solution (Cerilliant F-015)
Mephedrone hydrochloride solution (Cerilliant M-138)
Methedrone hydrochloride solution (Cerilliant M-147)
3,4-Methylenedioxypyrovalerone HCl (MDPV) solution (Cerilliant M-146)
Methylone hydrochloride (Cerilliant M-140)