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Development and validation of a new microcrystalline test for the identification of 6-APB and its isomers

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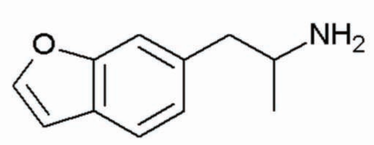
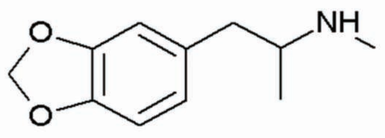
Background

- 6-APB (6- (2-aminopropyl) benzofuran), an MDMA-like stimulant, rose to prominence during the recent popularisation of legal highs
- Sold under the title of '*Benzo fury*', this drug presented a serious risk to its users, being involved in a number of hospitalisations and fatalities across the UK
- The sudden emergence of legal highs placed an alarming amount of pressure on law enforcement and highlighted the need for rapid and inexpensive methods of analysis

- The microcrystalline test is a quick and specific technique that can be used to identify drugs in seized drug samples
- The test produces microcrystals based on the target compounds molecular structure
- No such test currently exists for 6-APB or any of its isomers. The aim of this experiment was to fully develop and validate a new test for these drugs.



6-APB



MDMA

Methods

- Drug solutions were prepared using deionised water (15MΩ) at concentrations of 10 mg $mL^{=1}$ for 6-APB, 7-APB and 5-APB and 5 mg mL^{-1} for 4-APB and 2-APB
- **Platinic bromide (**hydrogen hexabromo platinate (IV) hydrate, H_2PtBr_6) reagent was prepared at 10 mg mL^{-1}
- A 5µL drop of drug solution was mixed with a 5 µL drop of reagent solution on the surface of a glass microscope slide and then observed under a light microscope until dry

Outcomes

– Platinic bromide produced unique crystals with all 5 drugs. No similar responses occur when the same reagent is added to other common drugs of abuse, including MDMA and methamphetamine
- Limit of detection (Table 1) and interferences from cutting agents (Table 2) were determined

Table 1. Limit of detection of the APBs

Drug	Limit of detection (mg mL-1)
7-APB	5
6-APB	1
5-APB	3
4-APB	0.5
2-APB	2

Table 2. Lowest drug: cutting agent ratios that produced positive results

Drug	Cutting agent		
	Caffeine	Benzocaine	Glucose
7-APB	9:1	7:1	1:8
6-APB	1:1	6:1	1:3
5-APB	3:1	8:1	1:16
4-APB	2:1	1:1	1:4
2-APB	1:1	4:1	1:20

- Benzocaine interfered the most, likely due to its effect on pH
- Glucose enhanced crystallisation and allowed the drugs to crystallise past their limit of detection
- The effect of having multiple isomers together was also investigated. Importantly both 5-APB and 6-APB crystals could be seen when the two were together. Whenever 2-APB was involved, it inhibited any crystal growth
- These findings are currently being drafted for submission to the journal drug testing and analysis