The sniffing experience – Detection of a single use of 'poppers'



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The Drug

Alkyl nitrites, also known as 'poppers', have a long history as medical drugs for treatment of cardiovascular problems and enhancer of sexual performance. 'Poppers' are mostly used as inhalants due to their volatility, and fatalities are rare. Typical effects include vasodilation, hypotension, methemoglobinemia and reduction of smooth muscle tonus including the anal sphincter. To our knowledge analytical verification of 'poppers' use by detection of the corresponding alcohols was only described in post mortem cases so far. We aimed to develop a method for detection of a modest dose of a 'poppers' product.

Introduction

The Experiment

A 44-year-old male volunteer took several breaths of "Rush Ultra Strong" containing isopropyl-, isobutyl-, n-pentyl- and 2methylbutyl nitrite within 10 minutes. Blood samples were taken 10 minutes prior the first sniff, between the second and the third sniff episode and 3, 11, 21 and 31 minutes after end of inhalation (see illustration).

Results

Physiological Effects

After the first and the third sniff-episodes (4 sniffs each) the 44-year-old male volunteers face flushed, he had a sensation of heat and the systolic blood pressure increased, whereas diastolic blood pressure and pulse remained stable. After the second inhalation – taking a deep breath an holding it for a few seconds – all three parameters, systolic and diastolic blood pressure and pulse raised significantly (see illustration). The volunteer described the effects as disturbing, and felt a little bit sick because of the malodorous 'poppers'. He did not feel any sexual excitation. All in all the volunteer did not enjoy the experience and does not want to repeat it



Analytical results

Blood samples

2-Methyl-1-butanol could be detected in the first 3 serum samples. 1-Pentanol was only found in the second sample (11

in mg/L	blank	t = 5 $t = 11$ $t = 20$ $t = 30 / 40$				
2-methyl-1-		1111	iules alle	rinnalatio)[]	
butanol	< LOD	0.02	0.05	0.01	< LOD	

Analytical results Rush Ultra Strong

The declaration on the bottle stated pentylnitrite as content. There is a little confusion about this special nitrite: in many papers pentylnitrite, isopentylnitrite, amylnitrite and isoamylnitrite are used synonymously. Nevertheless, there was more than one nitrite and the corresponding alcohol detectable.



Conclusion

Recreational use of 'poppers' is detectable by analysis of the corresponding alcohols only for relatively short time periods after consumption. Co-administration of alcoholic beverages could lead to overlap with typical congener alcohols like isobutanol and 2-methyl-1-butanol or slower

minutes after the first inhalation = two

minutes after the last inhalation), whereas

isopropanol and isobutanol could not be

detected. Concentrations ranged from 0.01

to 0.05 mg/L .

isopropanol < LOD < LOD < LOD < LOD < LOD < LOD

isobutanol < LOD < LOD < LOD < LOD < LOD < LOD

1-pentanol < LOD < LOD 0.03 < LOD < LOD

elimination of the alcohols by inhibition of ADH.



Please note Poster PA21: Detecting 'poppers' -Analysis of alkyl nitrites and their corresponding alcohols by HS-GC/FID.