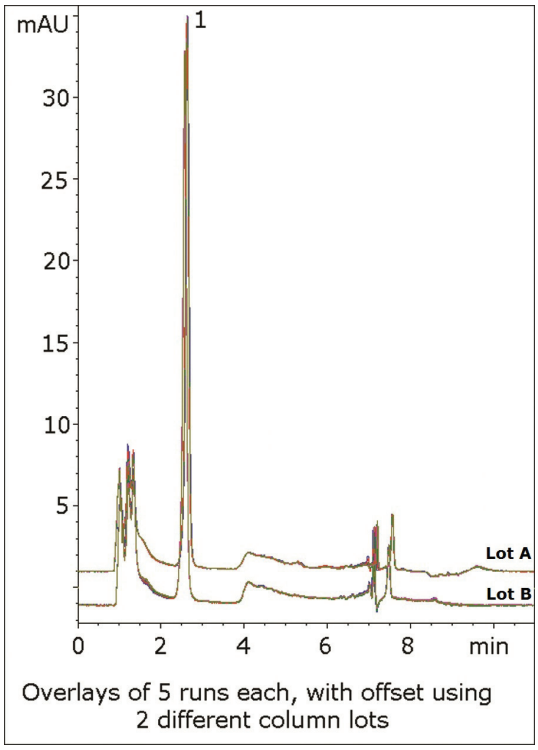
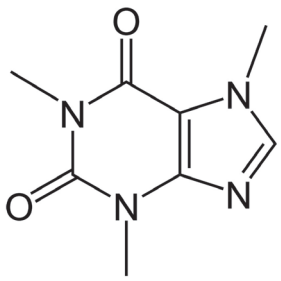
Caffeine in Coffee

Unique retention mode affords superior specificity



Overlays of 5 runs each, with offset using 2 different column lots



Caffeine

Note: Caffeine is a xanthine alkaloid found in the coffee plant, the tea bush, the kola nut, and other plants. It is the most commonly consumed psychoactive drug in the world.

Method Conditions

Column: **Cogent Diamond Hydride™**, 4µm, 100Å

Catalog No.: 70000-7.5P

Dimensions: 4.6 x 75 mm

Solvents: A: DI H_2O / 0.1% formic acid (v/v)
B: Acetonitrile / 0.1% formic acid (v/v)

Gradient:

time (min.)	%B
0	98
2	98
7	50
8	98

Post Time: 3 min

Injection vol.: 1µL

Flow rate: 1.0 mL/min

Detection: UV 275 nm

Sample: Commercially available ground coffee was brewed and filtered with a 0.45µm nylon syringe filter (MicroSolv Tech Corp.). It was then diluted 1:10 with a diluent of 50/50 solvent A / solvent B. The caffeine peak identity was confirmed with a USP reference standard.

Peak: 1. Caffeine

t_0: 0.9 min

Discussion

Although caffeine retains well in reversed phase, it is found to be difficult to obtain a well-resolved peak free of interference from other matrix peaks with a complex sample such as coffee. In this method, most of the matrix peaks elute near the void volume and do not interfere with the caffeine peak, which is well-resolved from the others. The method illustrates the utility of the Cogent Diamond Hydride column in analyses where alternate selectivity would be beneficial.

Complex matrices can also adversely affect run-to-run repeatability due to compounds that do not elute from the column and change the chromatography. Here the data shows no sign of contaminant build-up on the column, as the run-torun overlays show. The lot-to-lot reproducibility is also good as well. Finally, the method conditions are LC-MS compatible.

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