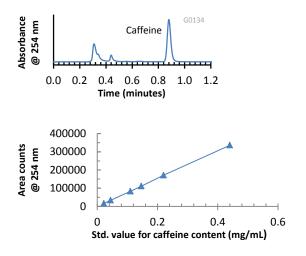
HALO: | Fused-Core® Particle Technology

Application Note: 145-F

Determination of Caffeine in Soda Using HALO 5 C18



TEST CONDITIONS:

Column: HALO 5 C18, 3.0 x 50 mm, 5 µm with HALO 5 guard column Part Number: HALO 5 C18, 95813-402 Part Number: Guard column: 95813-102 Mobile Phase: 75/25: A/B A= 0.1% formic acid in water B= Methanol Flow Rate: 0.8 mL/min. Pressure: 120 Bar Temperature: 30°C Injection Volume: 1.0 µL Sample Solvent: (caffeine std.) mobile phase Detection: UV 254 nm, VWD Response Time: 0.02 sec. Date rate: 25 Hz Flow Cell: 2.5 µL semi-micro LC System: Shimadzu Prominence UFLC XR ECV: ~14 µL

STRUCTURE:



Caffeine

advancedmaterialstechnology

www.advanced-materials-tech.com

DISCUSSION:

A selection of sodas was purchased along with several energy drinks at a local grocery store. An approximate 10 mL sample from each soda was placed in a separate 20 mL scintillation vial and capped. The vials were shaken several times and then the cap was loosened and the vial sonicated for 10 minutes to remove CO₂. Then a 1 mL aliquot was placed into a 1.5 mL HPLC sample vial. A one microliter quantity was injected into the HPLC under conditions tabulated elsewhere on this page. A guard column was used to prevent the buildup of a brown material on the analytical column packing. The material was likely caramel coloring.

The chromatogram shown is from a regular cola drink.

A standard curve of peak area vs. caffeine concentration was made over the range of 0.11-0.44 mg/mL. These values were used to calculate the line fit of Y=mX + b. From the peak response the concentration of (mg of caffeine)/mL was calculated and then multiplied by the number of mL in the beverage can (usually 355 mL). Results are shown below.

| Caffeine tested | Can value |
|-----------------|---|
| mg/(355 mL) | mg/(355 mL) |
| 12 | N/A |
| 53 | 54 |
| 43 | 43 |
| 36 | 38 |
| 38 | 38 |
| 12 | N/A |
| 45 | 46 |
| 34 | 34 |
| 36 | 35 |
| 160 | 160 |
| 79 | 80 |
| 79 | 80 |
| 53.3 | 54 |
| 22 | 22 |
| 43 | 41 |
| 0 | N/A |
| 0 | N/A |
| 0 | N/A |
| | mg/(355 mL) 12 53 43 36 38 12 45 34 34 36 160 79 79 79 53.3 22 43 0 0 0 |

355 mL = 12 oz. *amount in 16 oz. (473 mL) cans **amount in 8.4 oz (248 mL) cans

FOR MORE INFORMATION OR TO PLACE AN ORDER, CONTACT:

[®] HALO and Fused-Core are registered trademarks of Advanced Materials Technology, Inc.