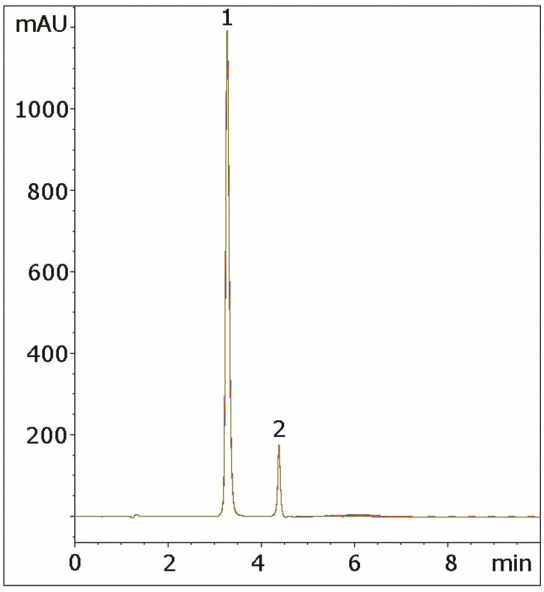
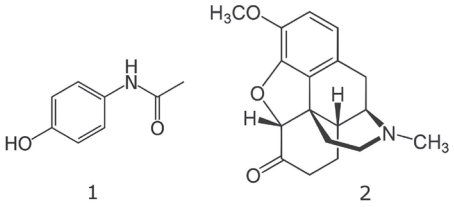
Hydrocodone/Acetaminophen

Simple, robust assay method



Overlay of 5 runs



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Note: Hydrocodone is a semi-synthetic opioid used as a narcotic analgesic to relieve moderate to severe pain. The formulation which includes acetaminophen is marketed under several trade names, including Vicodin® and Lortab®.

Method Conditions

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

Catalog No.: 69020-7.5P

Dimensions: 4.6 x 75 mm

Mobile Phase: A: DI H_2O / 0.1% TFA
B: Acetonitrile / 0.1% TFA

Gradient:

time (min.)	%B
0	5
1	5
5	60
6	5

Temperature: 35˚C

Injection vol.: 5µL

Flow rate: 1.0 mL/min

Detection: 0–4 min: UV 295 nm;
4–10 min: UV 210 nm

Samples: One tablet containing 5 mg hydrocodone / 500 mg acetaminophen was ground and diluted to 100 mL with 50/50 solvent A / solvent B mixture. The solution was then sonicated 10 min and filtered with a 0.45µm nylon syringe filter (MicroSolv Tech Corp.).

Peaks: 1. Acetaminophen
2. Hydrocodone

t_0: 0.9 min

Discussion

Hydrocodone can yield poor peak shapes in many conventional reverse-phase C18 methods due to its tertiary amine group. The USP assay method for hydrocodone in combination with acetaminophen uses triethylamine as a mobile phase additive to improve the peak shape. In this method however, only trifluoroacetic acid is needed in the mobile phase for a symmetrical hydrocodone peak when the Cogent Phenyl Hydride column is used. In addition, the repeatability of the analysis is excellent as the five-run overlay in the figure shows. Retention time %RSDs of < 0.1% were obtained for both peaks.

MANUFACTURED BY:
MICROSOLV TECHNOLOGY CORPORATION
9158 Industrial Blvd NE
Leland, NC 28451
p: 1.732.380.8900
f: 1.910.769.9435
customers@mtc-usa.com
www.Cogent-HPLC.com