

LABORATORY SERVICES BUREAU

Document: Controlled Substances Analysis Manual

Policy Number:
1539

Revision:
6

Subject: CS-SOP-28 Hydrocodone

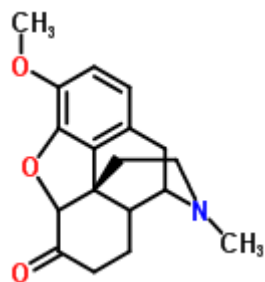
Approved:
Bell, Erica

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1. HYDROCODONE

A. Structure, Empirical Formula, Molecular Weight



Hydrocodone
 $C_{18}H_{21}NO_3$
MW 299.4

B. Synonyms: Dihydrocodienone

C. Trade Names: Lortab®, Vicodin®, Lorcet®, Triaminic®, etc.

D. Drug Action: Semi-synthetic narcotic analgesic

E. Common pharmaceutical/street forms: Tablets, capsules, cough syrups and suspensions for oral ingestion. It is most common in combination with acetaminophen but is also available in combination with aspirin, ibuprofen, chlorpheniramine, phenylephrine, pseudoephedrine, dextromethorphan, caffeine, and guaifenesin.

F. Solubility:

(1) Free base: Chloroform, ethanol, methanol, insoluble in water

(2) Various salts: Water, slightly soluble in methanol, insoluble in chloroform and diethyl ether

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G. Extraction:

- (1) Acid/base extraction for samples combined with acetaminophen, aspirin or ibuprofen.
 - (a) Determine the amount of sample required for extraction based on the concentration of hydrocodone in the sample.
 - (b) Grind tablet or remove liquid and place in a test tube.
 - (c) Add 0.2 N sulfuric acid.
 - (d) Extract with chloroform two times, discarding the chloroform₇-(bottom layer). If emulsions occur, the sample may be centrifuged.
 - (e) Basify the aqueous solution with 10% sodium hydroxide. Verify that the pH is basic.
 - (f) Extract with chloroform. If emulsions occur, the sample may be centrifuged.
 - (g) Remove the chloroform layer (bottom layer) and place into a clean well.
 - (h) Repeat steps (f) and (g), combining the chloroform extracts.
 - (i) Evaporate the chloroform and reconstitute with C15 methanol.
- (2) Dry extraction for samples that do not contain acetaminophen or aspirin
 - (a) Dissolve in C15 methanol.
 - (b) Filter to remove any insoluble material if necessary.

H. Chemical indicator tests:

- (1) Marquis: Purple
- (2) Liebermann's: Green to purple
- (3) Froehde's: Green changing to blue on standing
- (4) Mecke's: Blue-green

I. Crystal Tests: NA

J. TLC:

- (1) Mobile Phase:
 - (a) System 1: Chloroform:methanol (90:10)
 - (b) System 2: Methanol:conc. ammonium hydroxide (100:1.5)
- (2) Locator: Acidified iodoplatinate, Dragendorff reagent, Marquis reagent

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K. GC/MS: Analyze using "Drugs1" program.

L. Comments: Used for pain relief and as a cough suppressant.

Report as: Hydrocodone, a narcotic drug.

Example: (Vicodin® tablets)

Hydrocodone a narcotic drug in a usable condition. 25 tablet(s) as received.

M. References:

(1) Analytical Profiles of Narcotic Analgesics, CND Analytical, Inc., Auburn, AL, 1991.