

LABORATORY SERVICES BUREAU

Document: Controlled Substances Analysis Manual

Policy Number:
1521

Revision:
5

Subject: CS-SOP-41 Opium

Approved:
Bell, Erica

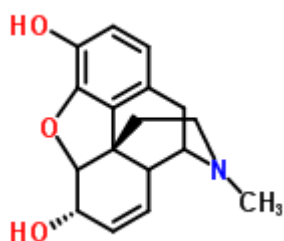
PHOENIX POLICE DEPARTMENT

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1. OPIUM

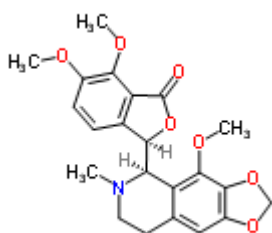
- A. Opium is the resin collected from the capsule of the opium poppy, *Papaver somniferum*.
- B. Principle active constituents: morphine (9-15%), codeine (0.7-2.5%), noscapine (4-8%), papaverine (0.8-1%), thebaine (0.3-1.5%) and meconic acid (3-5%).
- C. Structure, Empirical Formula, Molecular Weight



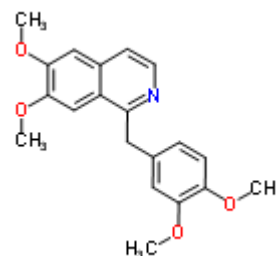
Morphine
 $C_{17}H_{19}NO_3$
MW 285.3



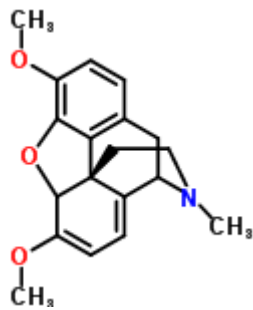
Codeine
 $C_{18}H_{21}NO_3$
MW 299.4



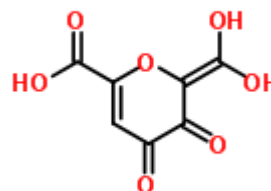
Noscapine
 $C_{22}H_{23}NO_7$
MW 413.4



Papaverine
 $C_{20}H_{21}NO_4$
MW 339.4



Thebaine
 $C_{19}H_{21}NO_3$
MW 311.3



Meconic acid
 $C_7H_4O_7$
MW 200.1

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- D. Synonyms: NA
- E. Trade Names: NA
- F. Drug Action: Narcotic analgesic
- G. Common pharmaceutical/street forms: It is a brown-black sticky substance that turns to hard light brown chunks or powder as it ages.
- H. Solubility of principle constituents: Slightly soluble in water, isopropyl alcohol, and methanol, insoluble in chloroform and diethyl ether
- I. Extraction:
 - (1) Dry extraction
 - (a) Grind sample and place in spot plate or test tube.
 - (b) Filter to remove any insoluble material if necessary.
 - (c) Extract with C15 methanol.
 - (2) Acid/base extraction
 - (a) Place a small amount of the material in a test tube.
 - (b) Add 0.2 N sulfuric acid.
 - (c) Extract with chloroform two times, discarding the chloroform (bottom layer). If emulsions occur, the sample may be centrifuged.
 - (d) Basify (saturate) the acidic solution with solid potassium carbonate. Verify that the pH is basic.
 - (e) Extract with chloroform:isopropyl alcohol (4:1). If emulsions occur, the sample may be centrifuged.
 - (f) Remove the chloroform:isopropyl alcohol layer and place into a clean well.
 - (g) Repeat steps e and f, combining the chloroform:isopropyl alcohol extracts.
 - (h) Evaporate the chloroform:isopropyl alcohol and reconstitute with C15 methanol.
- J. Chemical indicator tests:
 - (1) Marquis: Purple
 - (2) Liebermann's: Brown
 - (3) Froehde's: Purple-red
 - (4) Mecke's: Green

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K. 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

L. GC/MS: Analyze using "Drugs2" program.

M. Comments: Historically smoked or brewed in a tea for medicinal uses or to induce sleep. Currently it is used as a source of medicinal morphine and codeine, both used for pain relief.

Note: If any heroin is present, the sample should be reported as heroin and not opium.

N. Report as: A mixture of morphine and codeine, both narcotic drugs, and _____. Each is a component of opium.

Note: Any other opium alkaloids present should be listed above.

O. References:

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

(2) Inaba, D. S., Cohen, W. E., Holstein, M.E., Uppers, Downers, All Arounders, 3rd ed., CNS Publications, Inc., Ashland, OR, 1997, pp. 139-151.