

# Method for the Extraction of Basic Drugs of Abuse from Biological Fluids using ISOLUTE<sup>®</sup> HCX & RapidTrace<sup>®</sup> Workstation

## Introduction

This application note describes for the Extraction of Basic Drugs of Abuse from Biological Fluids using ISOLUTE HCX and RapidTrace Workstation.

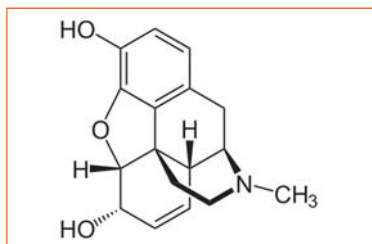


Figure 1. Structure of Morphine

The typical range of drugs screened using this generic method are Cocaine (as shown in figure 1), D3-Cocaine, Benzoylgonine-TMS, D3-Benzoylgonine-TMS, Amphetamine, D5-Amphetamine, Methamphetamine, Codeine, Morphine, Amitriptyline HCL, Nortriptyline HCL, Imipramine HCL, Desipramine HCL. These drugs represent a panel of the most significantly abused drugs as recommended by The National Institute on Drug Abuse (NIDA).

## Columns

ISOLUTE HCX (3 mL 200 mg part number 902-0020-B ) is a silica based mixed-mode sorbent that combines non-polar and strong cation exchange retention mechanisms for extraction of basic drugs from biological fluids.

*'The methods offered within this application are meant to represent a starting point and guide for method development and some amendment may be necessary.'*

## Analytes

Cocaine, D3-Cocaine, Benzoylgonine-TMS, D3-Benzoylgonine-TMS, Amphetamine, D5-Amphetamine, Methamphetamine, Codeine, Morphine, Amitriptyline HCL, Nortriptyline HCL, Imipramine HCL, Desipramine HCL.

## Sample pre-treatment

Urine: 2 mL sample is mixed with 1 mL of Phosphate buffer 0.05M - 0.1M pH6.

Blood and plasma: 1 mL sample mixed with 2 mL of phosphate buffer pH6. There is often the need to centrifuge blood samples and decant the extract to the Rapid-Trace system's sample vial.

Codeine and Morphine are treated with an ammonium acetate buffer pH8. A suitable 0.1 mL of internal standard can be added at this stage.

The SPE steps were configured schematically using the RapidTrace software as follows:

## RapidTrace procedure

	Step	Source	Destination	Volume (mL)	Flow (mL/min)
1	Condition	Methanol	Organic Waste	3.0	15.00
2	Condition	Water	Aqueous Waste	3.0	15.00
3	Condition	buffer	Aqueous Waste	3.0	15.00
4	Load	Sample	Bio Waste	3.0	1.00
5	Rinse	Water	Bio Waste	2.0	2.00
6	Purge-Cannula	Water	Cannula Waste	2.0	30.00
7	Rinse	0.1 M HCl	Bio Waste	2.0	2.00
8	Rinse	Methanol	Bio Waste	2.0	2.00
9	Dry	Time = 5 min			
10	Collect	Eluent	Fraction 1	3.0	30.00
11	Purge-Cannula	Methanol	Cannula Waste	3.0	30.00
12	Purge-Cannula	Water	Cannula Waste	3.0	30.00

## Reagent lines

Line 1: Water (sip speed = 30 mL/min)

Line 2: Methanol (sip speed = 30 mL/min)

Line 3: Phosphate buffer pH6 (sip speed = 30 mL/min)

Line 5: Elution solvent: Methylene chloride:isopropanol:ammonium hydroxide  
(v/v, 78:20:2) (sip speed = 30 mL/min) (Eluent)

Line 6: 0.1 M Hydrochloric acid (sip speed = 30 mL/min)

Biotage recommends TurboVap Workstations post elution to blow down your samples.

## Ordering information

Part number	Description	Quantity
902-0020-B	ISOLUTE HCX 3 mL 200 mg	50
C50000	RapidTrace 3 mL Workstation	1
C50974	Tube Rack (13 x 100 mm Sample Tubes & 12 x 75 Fraction Tubes)	1
C40707	Test Tubes-13 x 100 mm	1000
C44651	Test Tubes-12 x 75 mm	1000
C52006	RapidTrace Start-Up Kit	1
C52689	RapidTrace Notebook Controller	1

## RapidTrace Overview



The RapidTrace has been designed to eliminate sample preparation bottlenecks and it is a modular, highly scalable, automated platform designed for high throughput. Units are available to accommodate 1 mL, 3 mL and 6 mL SPE cartridges. Up to 10 modular units can be connected together and controlled through a simple, easy-to-use software package. The systems are widely used within analytical industry and are ideal both for industrial settings and for efficient SPE method development.

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