

# Drugs of abuse in human plasma using SOLA $\mu$ solid phase extraction

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## Introduction

There is an urgent need for robust analytical methods for performing research on the measurement of opioids in complex biological matrices like blood and urine. For these dirty biological samples, sample preparation with solid phase extraction (SPE) results in cleaner samples which improves sample analysis by removing signal interferences. Micro-elution SPE can be used to concentrate samples up to 20 times for lower limits of detection. The Thermo Scientific™ SOLA™ SPE range uses innovative frit-less SPE technology which eliminates the issues with traditional loose-packed SPE formats. Combining the support material and active media components into a solid, uniform sorbent bed provides stable and controllable flow through characteristics and has an added advantage when dealing with viscous biological samples, as it prevents blocking and enables high throughput.

## Important notes

- For a fast 4-minute LC-MS analysis of 23 drugs of abuse using the Thermo Scientific™ Accucore™ Biphenyl column<sup>1</sup>
- The volumes in this protocol have been optimized for the 2 mg Thermo Scientific™ SOLA $\mu$ ™ 96 well plate, and in this case provide a 10-fold sample concentration factor. Volumes can be adjusted for 10 mg SOLA SPE cartridges or 96 well plates but a dry down step after elution may be required to achieve sensitivity.



## Materials required

- SOLA $\mu$  SCX, 2 mg/1mL 96-well plate (P/N 60209-002)
- 96-well collection plates for waste and sample collection
- 96-well vacuum or positive pressure SPE manifold
- Water, Optima™ LC/MS grade, Fisher Chemical (P/N W6500)
- Methanol (MeOH), Optima™ LC/MS grade, Fisher Chemical (P/N A456-500)
- Acetonitrile (ACN), Optima™ LC/MS grade, Fisher Chemical (P/N A955-500)
- Thermo Scientific™ Pierce™ Formic Acid (FA) (P/N PI28905)
- Triethylamine (TEA), HPLC grade, Fisher Chemical (P/N 04884-100)

## Protocol

1. Dilute 200  $\mu$ L urine with 800  $\mu$ L of 1% formic acid in water. Vortex for 30 seconds and then centrifuge for 5 minutes at 5000 RPM.
2. Condition SOLA $\mu$  SCX plate with 200  $\mu$ L methanol.
3. Equilibrate with 200  $\mu$ L water.
4. Load 1000  $\mu$ L sample.
5. Wash with 200  $\mu$ L 0.1% formic acid in water.
6. Elute with two 25  $\mu$ L fractions of MeOH/ACN/TEA (45/45/10), collect eluate.
7. Dilute eluate with 50  $\mu$ L water.

## Reference

1. Kean Woodmansey, Jon Bardsley, Stacy Tremintin, *Fast and easy separation of 23 drugs of abuse using the Accucore Biphenyl Column*, Technical Note 21883

## Related products

Description	Part number
SOLA $\mu$ SCX 96 well plates, 2 mg	60209-002
Thermo Scientific™ WebSeal 96 well round well plate, 2 mL, V-shape	60180-P207
Thermo Scientific™ WebSeal mat, Silicone/PTFE, blue, round	60180-M112
Thermo Scientific™ HyperSep™ 96 well plate vacuum manifold	60103-351
Thermo Scientific™ WebSeal Mat, 96 well square plate	60180-M122

Current versions of product instructions are available at [thermofisher.com/chromexpert](https://thermofisher.com/chromexpert)

Learn more about SOLA and SOLA $\mu$  products at [thermofisher.com/solaspe](https://thermofisher.com/solaspe)