APPLICATION BRIEF 22004

Fast and easy separation of 23 drugs of abuse using the Accucore Biphenyl Column

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Introduction

There is an urgent need for robust analytical methods for performing research on the measurement of drugs of abuse. This short protocol describes a method for the separation of 23 drugs of abuse including high, stable resolution of isobaric opioids from human urine by UHPLC-MS/MS using the Thermo Scientific™ Accucore™ Biphenyl HPLC Column. The new Accucore Biphenyl column shows a well-tuned balance of efficiency and selectivity and is a powerful and robust tool for the determination of drugs of abuse.

Important notes

- This method was optimized for urine samples that are diluted before analysis. The same chromatographic conditions may be used for more complex samples and lower limits of detection with additional sample preparation.[1]
- Low recovery for basic active compounds, like buprenorphine, may be due to interaction with vials. We recommend using Thermo Scientific™ Chromacol™ GOLD grade vials for the best performance.
- Reference the entire application.[2]

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Materials required

- UHPLC-MS instrument such as Thermo Scientific™ Vanquish™ Horizon UHPLC System with Thermo Scientific™ TSQ Quantiva™ Triple Quadrupole Mass Spectrometer
- Thermo Scientific™ Accucore™ Biphenyl HPLC columns, 50 x 2.1 mm, 2.6 µm (P/N 17826-052130)
- Water, UHPLC-MS grade
- Methanol, UHPLC-MS grade
- Formic acid, analytical grade

Protocol

1. Dilute 100 µL urine sample with 900 µL of 0.1% formic acid in water.

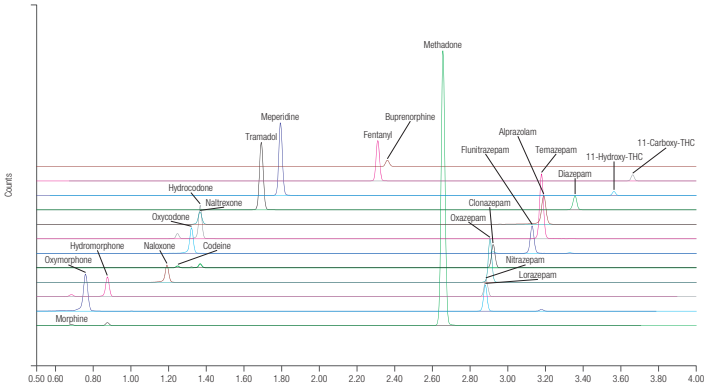

Figure 1. Separation of 23 drugs of abuse under 4 minutes on the Accucore Biphenyl column

2. Analyze samples using the following HPLC conditions:

Mobile phase A	0.1% formic acid in water		
Mobile phase B	0.1% formic acid in methanol		
Flow rate	0.75 mL/min		
Gradient program	**Time (min)**	**%A**	**%B**
	0.0	95	5
	0.15	95	5
	4.0	0	100
	4.0	0	100
	4.6	0	100
	4.6	95	5
	5.5	95	5
Column temperature	45 ˚C, with active pre-heating and forced air		
Injection volume	2 µL		
Detection	HESI-MRM		

Related products

Description	Part number
Accucore Biphenyl HPLC Column, 50 x 2.1 mm, 2.6 µm	17826-052130
Chromacol SureStop GOLD grade vial, clear 2 mL, screw thread	2-SVWGK

References

1. CS Center of Excellence (CoE) Application Scientists, Thermo Fisher Scientific, *Drugs of abuse in human plasma using SOLAµ solid phase extraction,* Application Brief 22007
2. Kean Woodmansey, Jon Bardsley and Stacy Tremintin, *Fast and easy separation of 23 drugs of abuse including high, stable resolution of isobaric opioids from human urine by UHPLC-MS/MS,* Technical Note 21883

Current versions of product instructions are available at **thermofisher.com/chromexpert**

Find out more at **thermofisher.com/biphenyl** and **thermofisher.com/appslab**

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