



## Chiral Separation of Clenbuterol Using UPC 2

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This is an Application Brief and does not contain a detailed  
Experimental section.

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## Abstract

Using UPC<sup>2</sup> with smaller particle columns, a rapid method for chiral analysis of clenbuterol was developed. The analysis was completed in less than three minutes, allowing for high throughput analysis. The method was also reproducible over several injections and utilized mobile phases compatible with mass spectrometry detection for possible analysis in bioanalytical studies.

### Benefits

Fast analysis in less than 3 minutes

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## Introduction

Clenbuterol is a drug used by people with chronic breathing disorders, such as asthma, as a bronchodilator to make breathing easier. Clenbuterol is more potent and longer-lasting as a stimulant than other compounds. Dosage is typically in the range of 2 to 40 mg per day, thus sensitive methods of analysis are needed to separate the enantiomers of clenbuterol at a low level.

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## Experimental

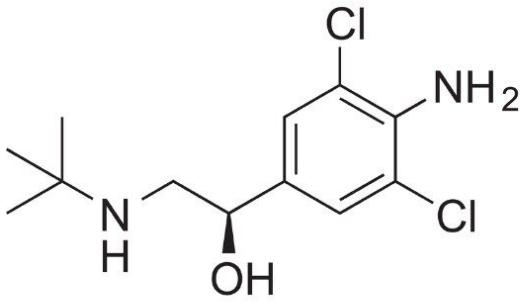
### Instrumentation and consumables

System:	ACQUITY UPC <sup>2</sup> with photodiode array (PDA) detection
Column:	CHIRALPAK IA, 4.6 x 100 mm, 3 μm
Column temp.:	40 °C
Mobile phase A:	CO <sub>2</sub>

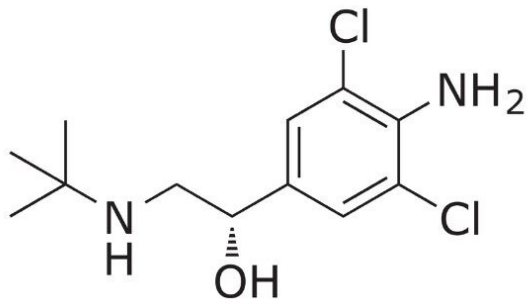
Mobile phase B:	MeOH with 0.5% CH <sub>3</sub> COONH <sub>4</sub>
Isocratic conditions:	85% A, 15% B
Flow rate:	2 mL/min
Back pressure:	1500 psi
Detection:	UV 297 nm, compensated 350 to 450 nm
Injection volume:	2 µL for 0.2 mg/mL, 6 µL for 0.002 mg/mL
Sample prep:	0.1 mg/mL and 0.001 mg/mL each enantiomer in 1:1 EtOH/heptane
Vials:	Waters Maximum Recovery Vials
Data management:	Empower 3 Software

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## Results and Discussion



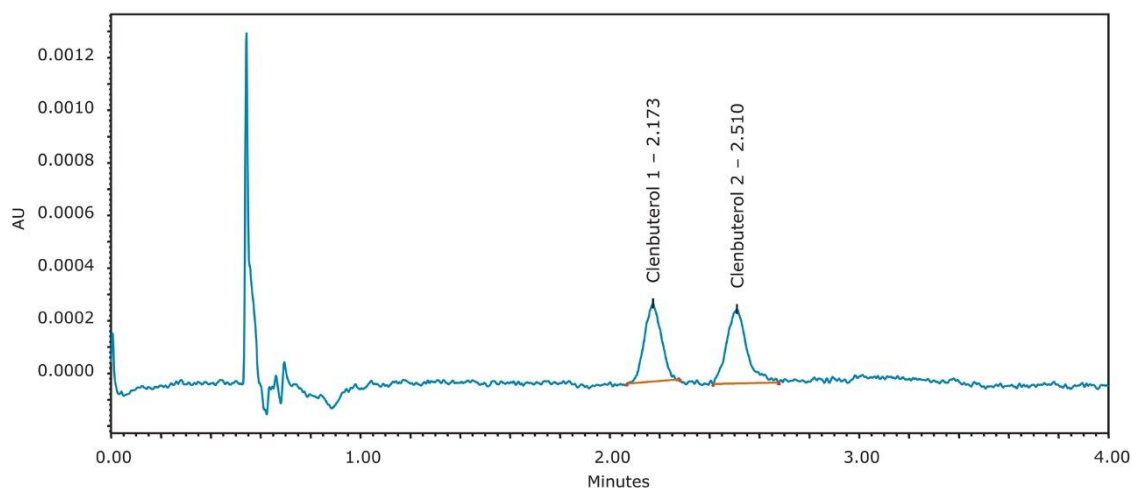
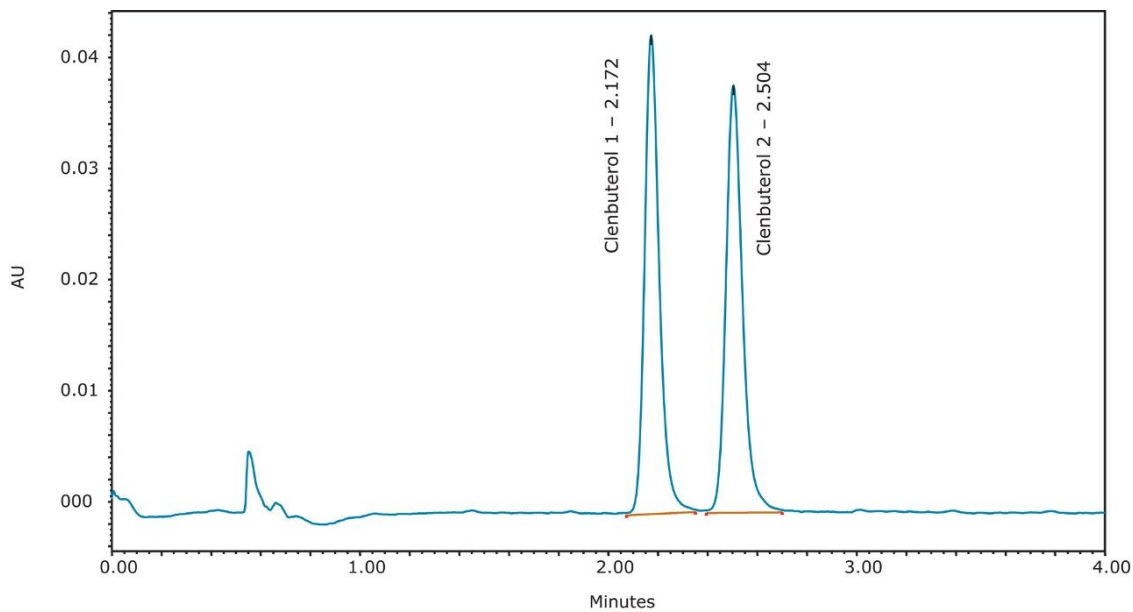
(R)-Clenbuterol



(S)-Clenbuterol

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*(R)-Clenbuterol, (S)-Clenbuterol*



*Separation of clenbuterol enantiomers using UPC<sup>2</sup>.*

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## Conclusion

Using UPC<sup>2</sup> with smaller particle columns, a rapid method for chiral analysis of clenbuterol was developed. The analysis was completed in less than 3 min, allowing for high throughput analysis. The limit of quantitation (LOQ) was less than 1 µg/mL using UV detection for chiral analysis at low concentrations. The method was also reproducible over several injections and utilized mobile phases compatible with mass spectrometry detection for possible analysis in bioanalytical studies.

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## Featured Products

ACQUITY UPC2 System <<https://www.waters.com/134658367>>

ACQUITY UPLC PDA Detector <<https://www.waters.com/514225>>

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