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응용 자료

Chiral Separation of Clenbuterol Using UPC 2

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

Abstract

Using UPC^2 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

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.

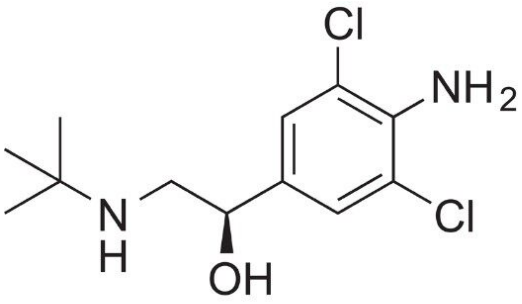
Experimental

Instrumentation and consumables

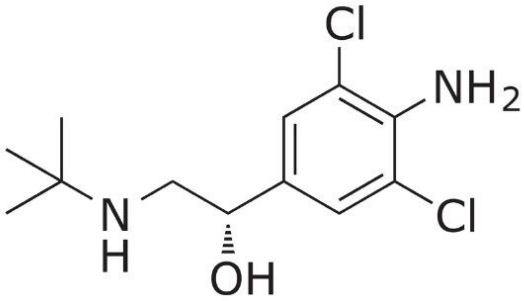
System:	ACQUITY UPC^2 with photodiode array (PDA) detection
Column:	CHIRALPAK IA, 4.6 x 100 mm, 3 µm
Column temp.:	40 °C
Mobile phase A:	CO_2

Mobile phase B:	MeOH with 0.5% CH_3COONH_4
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

Results and Discussion

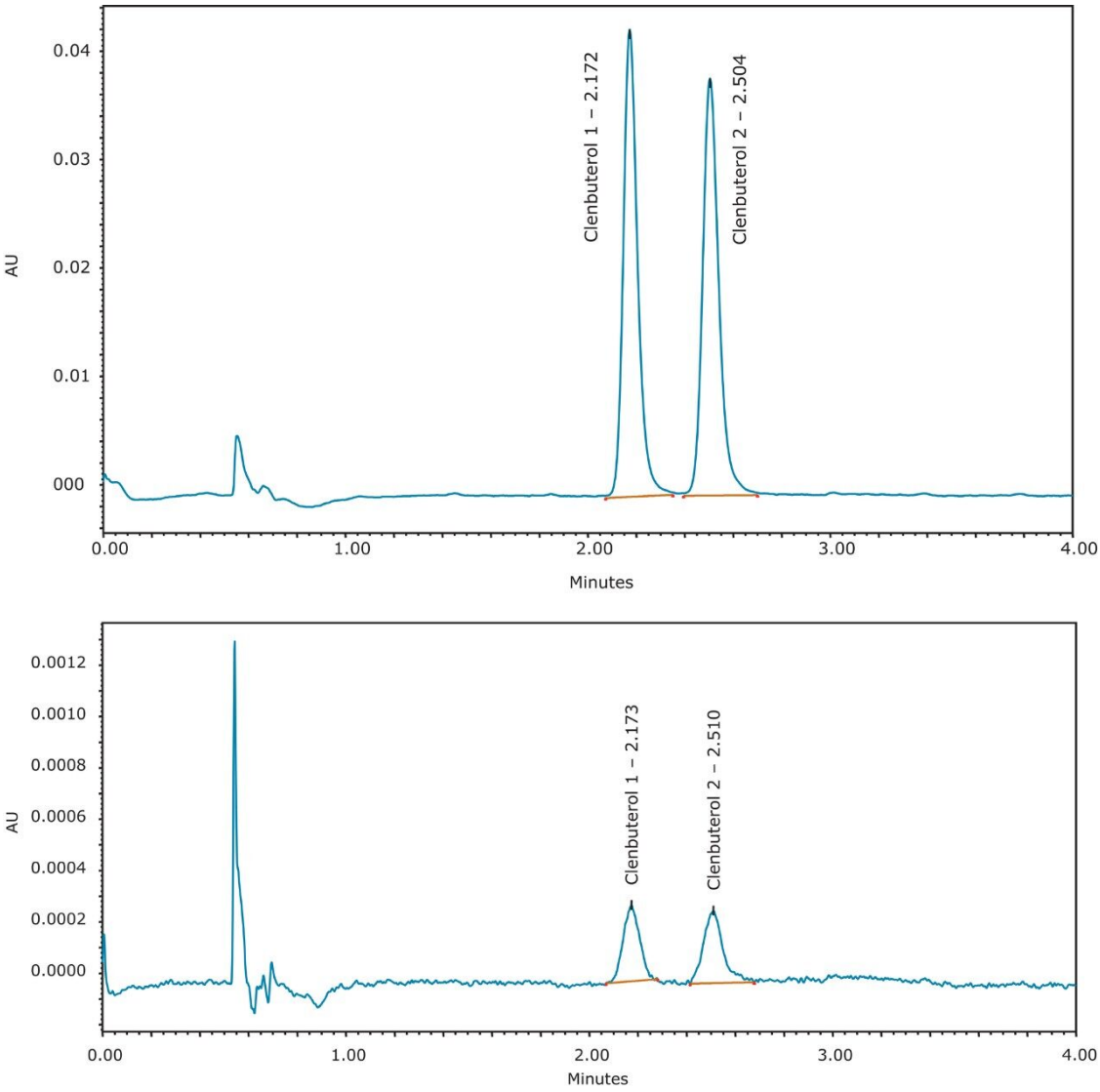


(R)-Clenbuterol



(S)-Clenbuterol

(R)-Clenbuterol, (S)-Clenbuterol



Separation of clenbuterol enantiomers using UPC^2.

Conclusion

Using UPC^2 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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ACQUITY UPC2 System <https://www.waters.com/134658367>

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

720004537, December 2012