

Analysis of 3 Nonsteroidal Anti-inflammatory Drugs Using a Solid Core HPLC Column

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Key Words

Accucore Polar Premium, Core Enhanced Technology, fused core, superficially porous, ketoprofen, naproxen, ibuprofen

Abstract

This application note demonstrates the selectivity of the Thermo Scientific™ Accucore™ Polar Premium HPLC column for the fast analysis of 3 nonsteroidal anti-inflammatory drugs.

Introduction

Accucore HPLC columns use Core Enhanced Technology™ to facilitate fast and high efficiency separations. The 2.6 µm diameter particles are not totally porous, but rather have a solid core and a porous outer layer. The optimized phase bonding creates a series of high coverage, robust phases. Accucore Polar Premium is an exceptionally rugged polar embedded reverse phase material that offers high efficiency, single run separation of polar and non-polar analytes. The specially designed bonded phase is stable from pH 1.5 to 10 and will not dewet in 100% aqueous mobile phase. The tightly controlled 2.6 µm diameter of Accucore particles results in much lower backpressures than typically seen with sub-2 µm materials.

Nonsteroidal anti-inflammatory drugs (NSAIDs) are widely used for the treatment of moderate pain relief and inflammation. Ketoprofen, naproxen and ibuprofen are amongst some of the most widely used NSAIDs. The selectivity of the Accucore Polar Premium phase is demonstrated here by the separation of 3 acidic NSAIDs.

Experimental Details

Consumables	Part Number
Fisher Scientific HPLC grade water	W/0106/17
Fisher Scientific HPLC grade acetonitrile	A/0626/17
Fisher Scientific Analytical grade phosphoric acid	O/0515/PB08
Thermo Scientific Premium vial with 8mm screw cap fitted with a silicone / PTFE cap	60180-600



Sample Preparation

Primary standards of each of the compounds were prepared in methanol to a concentration of 1mg/mL.

The working standard contained the following concentrations in water:

10 µg/mL of ketoprofen
10 µg/mL of naproxen
50 µg/mL of ibuprofen

Separation Conditions	Part Number	
Instrumentation:	Thermo Scientific Accela LC system	
Column:	Accucore Polar Premium 2.6 μ m, 50 x 2.1 mm	28026-052130
Mobile phase A:	0.1% orthophosphoric acid in water	
Mobile phase B:	0.1% orthophosphoric acid in acetonitrile	
Gradient:	30-60% B in 3 minutes	
Column Temperature:	30 °C	
Injection volume:	1 μ L	
Flow rate:	0.5 mL/min	
UV detection:	265 nm	

	Ketoprofen	Naproxen	Ibuprofen
Mean retention time (min)	1.27	1.40	2.36
%RSD retention time	0.00	0.01	0.00
Mean asymmetry	1.24	1.21	1.22
Mean resolution	–	2.25	16.02

Table 1: Results obtained from Accucore Polar Premium based upon data derived from 6 replicate injections

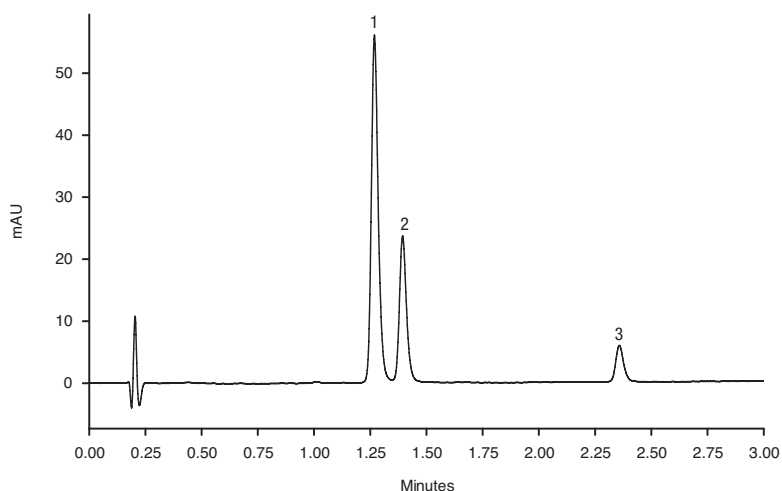


Figure 1: Chromatogram for ketoprofen 1, naproxen 2, and ibuprofen 3, separated on an Accucore Polar Premium 2.6 μ m, 50 x 2.1 mm column.

Conclusion

- Ketoprofen, naproxen and ibuprofen are successfully resolved using Accucore Polar Premium.
- Separation can be achieved less than 3 minutes.
- Asymmetry better than 1.25 for all compounds demonstrating excellent peak shape.
- Retention time reproducibility (%RSD) less than 0.01 for all 3 compounds.

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