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# lication Note 20596

# **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<sup>™</sup> Accucore<sup>™</sup> Polar Premium HPLC column for the fast analysis of 3 nonsteroidal anti-inflammatory drugs.

## Introduction

Accucore HPLC columns use Core Enhanced Technology<sup>™</sup> 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                                  | 0/0515/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 µm, 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 µL                                       |              |
| Flow rate:            | 0.5 mL/min                                 |              |
| UV detection:         | 265 nm                                     |              |

|                           | Ketoprofen | Naproxen | lbuprofen |
|---------------------------|------------|----------|-----------|
| 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  $\mu$ 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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