

# The Fast Analysis of 6 Benzoic Acids Using a Core Enhanced Technology Accucore HPLC Column

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## Key Words

- Fused core
- Superficially porous
- Intermediates
- Acids
- Core Enhanced Technology
- Accucore C18

## Abstract

This application note demonstrates the use of the Thermo Scientific Accucore C18 columns for the fast analysis of benzoic acids.

## 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 optimised phase bonding creates a series of high coverage, robust phases. The tightly controlled 2.6 µm diameter of Accucore particles results in much lower backpressures than typically seen with sub-2 µm materials.

Benzoic acids are used in a variety of industries, including the manufacturing of drugs, pesticides and dyes. These compounds lend themselves to analysis by reverse-phase at reduced pH.

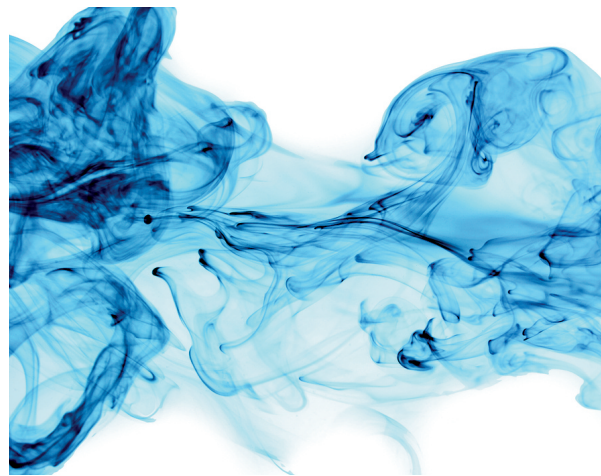
## Results

A good separation of the benzoic acids was achieved using the specified mobile phase. The low pH buffer helps to suppress the ionization of the acids, which have pKa values typically of 3 to 4.5.

The acid separation was achieved at 0.8 ml/min, which is four-times the linear velocity typically used with a conventional packed 2.1 mm column. This was achieved at less than 250 bar using a conventional low-pressure HPLC instrument.

## Conclusions

The Accucore C18 HPLC columns provides good separation of a range of benzoic acids in less than 1 minute using a conventional low pressure HPLC instrument.



## Sample Preparation

Uracil (1.0 mg), phthalic acid (1.0 mg), 2-fluorobenzoic acid (2.1 mg), 3-nitrobenzoic acid (1.0 mg) and 3-fluorobenzoic acid (1.0 mg) were each dissolved in 1.0 mL methanol/water (50:50). Each of these solutions (100 µl) were mixed and made up to 1000 µL with methanol/water (50:50).

Thermo Scientific Column	Part Number
Accucore C18 2.6 µm 100 x 2.1mm	17126-102130
Measured backpressure: 248 bar	

## Thermo Scientific HPLC system

Column temperature	40 °C
Injection volume	1.0 µL
Flow rate	0.8 mL/min
UV detection	254 nm

## Mobile Phase

Sodium hydrogen phosphate (Na<sub>2</sub>HPO<sub>4</sub>) 25mM pH 2.5/methanol (65:35)

Consumables	Part Number
Fisher Scientific HPLC grade water	W/0106/17
Fisher Scientific HPLC grade methanol	M/4056/17
NSC Mass Spec Certified 2 mL clear vial with blue bonded PTFE silicone cap	MSCERT4000-34W

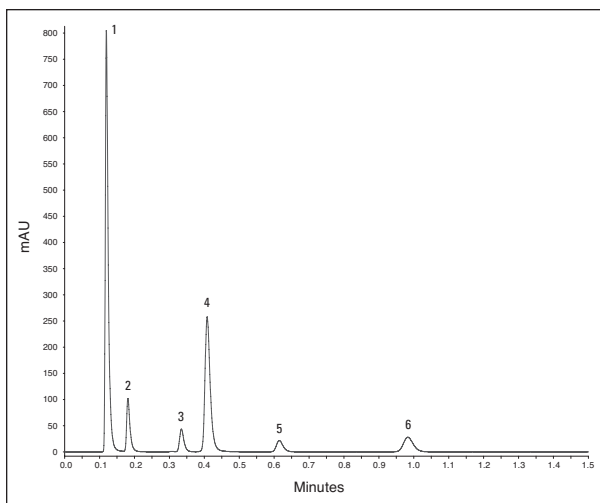


Figure 1: The separation of 5 benzoic acids on Accucore C18  
 Compounds: (1) Uracil (2) Phthalic acid (3) 2-fluorobenzoic acid  
 (4) 3-nitrobenzoic acid (5) 3-fluorobenzoic acid (6) m-toluic acid

Parameter	Mean	%CV
%T <sub>f</sub>	1.20	1.3
N	5542	0.3

Table 1: Method precision - using retention time, asymmetry and the efficiency of peak 6 and derived from 6 replicate injections

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