Application Note: ANCCSCETBASES

Separation of Bases Using a Core Enhanced Technology Accucore HPLC Column.

Anila Khan, Thermo Fisher Scientific, Runcorn, Cheshire, UK

Key Words

- Accucore RP-MS
- Superficially porous
- Core Enhanced Technology
- Fused core
- Bases

Abstract

This application note demonstrates the use of Thermo Scientific Accucore RP-MS columns for the separation of basic and neutral compounds.

Introduction

The HPLC analysis of basic compounds can be problematic as secondary interactions with residual acidic silanols on the surface of the silica support of the stationary phase can cause peak tailing. 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. Accucore RP-MS uses an optimized alkyl chain length for more effective coverage of the silica surface. This coverage results in a significant reduction in secondary interactions and thus highly efficient peaks with very low tailing. The tightly controlled 2.6 µm diameter of Accucore particles results in much lower backpressures than typically seen with sub-2 µm materials.

Sample Preparation

A 1000 µg/mL solution of base standards was prepared in water, apart from acenaphthene and naphthalene which were prepared in methanol; these solutions were then diluted with methanol to the required concentrations (refer to Table 1)

Thermo Scientific Column	Part Number
Accucore RP-MS 2.6 µm 50 x 2.1mm Measured pressure: 232 bar	17626-052130

Thermo Scientific HPLC System

Column temperature	30 °C
Injection volume	1 µL
Flow rate	0.5 mL/min
PDA/UV detection	215 nm

Mobile Phase

65:35 Methanol/25 mM potassium phosphate pH, 7.00

Consumables	Part Number
HPLC grade water, Fisher Scientific	W/0106/17
HPLC grade Methanol, Fisher Scientific	M/4056/17
Liquid handling hardware: FinnPippette (100-1000µL)	642090
NSC Mass Spec Certified 2 mL clear vial with PTFE silicone cap	MSCERT4000-34W

Thermo SCIENTIFIC

Results

Figure 1 shows the chromatogram of the basesic and neutral compounds separated on an Accucore RP-MS 2.6 µm 50 x 2.1 mm column under 2.5 minutes. The analysis demonstrates this column can provide not only a good baseline resolution but excellent retention time reproducibility when these compounds are separated. Amitriptyline tailing factor is low at 1.27.

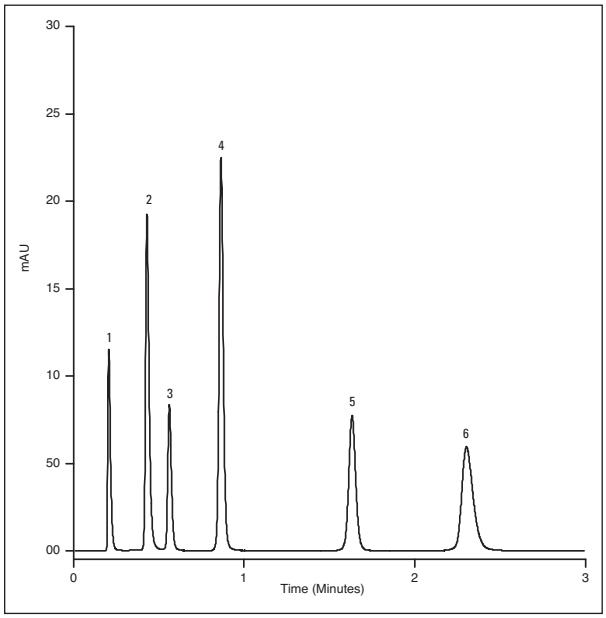

Figure 1: Chromatogram of basic and neutrals separated on an Accucore RP-MS 2.6 µm 50 x 2.1 mm column

	Compounds	Sample Conc µg/mL	t_r/min	%RSD (t_r/min) n=6
1	Uracil	20	0.21	0.29
2	Butyl paraben	20	0.43	0.72
3	propranolol	20	0.56	0.42
4	Napthalene	5	0.87	0.50
5	Acenaphthene	5	1.64	0.28
6	Amitriptyline	20	2.31	1.05

Table 1: The analysis of basic and neutrals separated on an Accucore RP-MS 2.6 µm 50 x 2.1 mm column

Conclusions

The separation of bases was successfully achieved on the Accucore RP-MS column giving excellent retention time reproducibility and resolution. Therefore, this provides an excellent choice of column for the analysis of bases and neutrals.

In addition to these offices, Thermo Fisher Scientific maintains a network of representative organizations throughout the world.

North America
USA and Canada
+1 800 332 3331

Europe
France
+33 (0)1 60 92 48 34

Germany
+49 (0) 2423 9431 -20 or -21

Switzerland
+41 56 618 41 11

United Kingdom
+44 1928 534110

Asia
Japan
+81 3 5826 1615

China
+86-21-68654588
or +86-10-84193588
800-810-5118

India
1800 22 8374 (toll-free)
+91 22 6716 2200

Thermo Fisher Scientific Australia Pty Ltd
1300 735 292 (free call domestic)

Thermo Fisher Scientific New Zealand Ltd
0800 933 966 (free call domestic)

All Other Enquiries
+44 (0) 1928 534 050

Technical Support

North America
800 332 3331

Outside North America
+44 (0) 1928 534 440

www.thermoscientific.com/chromatography

ANCCSCETBASES 0611