Application Note: ANCCSCETHERB

Separation of Urea Herbicides Using a Core Enhanced Technology Accucore HPLC Column

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Key Words

- Accucore RP-MS
- Superficially porous
- Core Enhanced Technology
- Fused core
- Urea herbicides

Abstract

This application note demonstrates the use of Thermo Scientific Accucore RP-MS column for the separation of urea herbicides.

Introduction

Urea herbicides are generally used in weed control in agricultural and non-agricultural practices and work by inhibiting photosynthesis. Some of the urea herbicides can be very unrelenting in the environment and there is the danger that they are present in the drinking water, for instance. When high concentrations of urea herbicides are ingested by humans, this can cause blood poisoning. The common symptoms of which are nausea, vomiting and stomach pain.

Separation of selected urea herbicides was achieved using an Accucore™ RP-MS column. 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 of urea herbicide standard mixture solution was prepared in 1:1 acetonitrile/water; this solution was then diluted to 20 µg/mL in water and used for the analysis.

Thermo Scientific Column	Part Number
Accucore RP-MS 2.6 µm 100 x 2.1mm	17626-102130

Thermo Scientific Accela HPLC/UHPLC

Column temperature	25 °C
Injection volume	3.0 µL
Flow rate	0.43 mL/min
UV detection	240 nm

Mobile Phase

Mobile phase A:	Water
Mobile phase B:	Acetonitrile
Gradient:	35-60 %B in 3.20 minutes

Consumables	Part Number
Fisher Scientific HPLC grade water	W/0106/17
Fisher Scientific HPLC grade Acetonitrile	A/0626/17
NSC Mass Spec Certified 2mL clear vial with PTFE silicone cap	MSCERT4000-34W

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Results

Figure 1 shows the chromatogram of the urea herbicide separated on an Accucore RP-MS 2.6 µm 100 x 2.1 mm column under 3.5 minutes. The analysis was performed using fast HPLC demonstrating this column can provide good baseline resolution of the analytes.

Conclusions

The separation of urea herbicides was successfully achieved on Accucore RP-MS column. This column provides an excellent choice for the analysis of these herbicides giving excellent retention time reproducibility and good resolution.

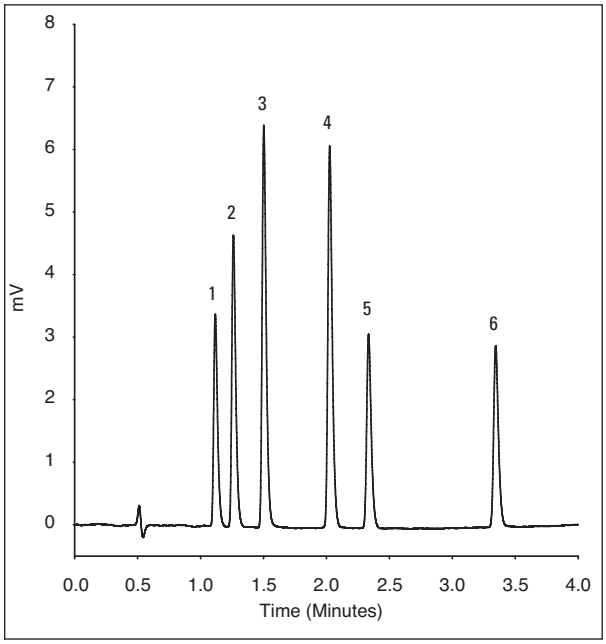

Figure 1: Chromatogram of 20 µg/mL of the urea herbicide mixture separated on an Accucore RP-MS 2.6 µm 100 x 2.1 mm column

	t_r/min	Compound
1	1.12	Monuron
2	1.27	Metoxuron
3	1.54	Linuron
4	2.04	Diuron
5	2.35	Terbuthiuron
6	3.36	Chlortoluron

Table 1: The analysis of urea herbicides on an Accucore RP-MS 2.6 µm 100 x 2.1 mm column

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