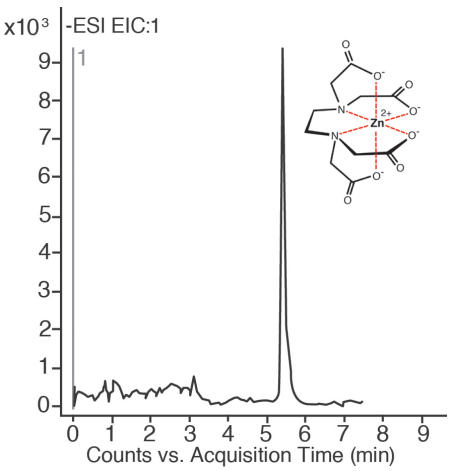
Applications of Cogent TYPE-C™ Columns

Environmental Applications continued

For many other Environmental applications go to www.mtc-usa.com and click on Knowledge Base.

Zinc-EDTA Complex by ANP LC-MS

Figure 73.



Method Conditions

Column: **Cogent Diamond Hydride™**, 4µm, 1 00Å
Catalog No.: 70000-15P-2
Dimensions: 2.1 x 150mm
Mobile Phase:
A: DI H_2O/ 0.1% (v/v) formic acid
B: Acetonitrile/ 0.1% (v/v) formic acid

Gradient:

time (min.)	%B
0	90
5	20
8	20
9	90

Post Time: 2 min
Injection vol.: 1µL
Flow rate: 0.4mL/min
Detection: ESI – NEG - Agilent 6210 MSD TOF mass spectrometer

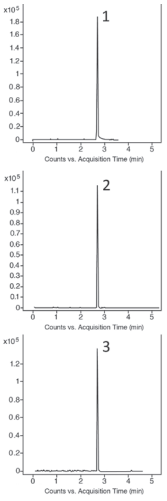
Sample: A soil sample was spiked with Zn-EDTA complex at a level of 2000µM. After extraction with DI water (shaking for 24 hours), the sample was filtered using a 0.45µm syringe filter (MicroSolv Tech. Corp.) and diluted with acetonitrile 1:10 before injection.
Peak: Zn-EDTA complex 354.7m/z t0: 0.9 min

Discussion

Using conventional analytical methods, retention of metal–EDTA complexes is accomplished using ion pair reversed phase chromatography. However, the ion pair agents used in the mobile phase are not compatible with mass spectrometry. In this LC-MS method using the Diamond Hydride™ column, only formic acid is needed in the mobile phase in order to obtain retention of a Zinc-EDTA complex. The figure shows an EIC of the analyte spiked in a soil extract matrix.

Glufosinate Herbicide and Metabolites by ANP LC-MS

Figure 74.

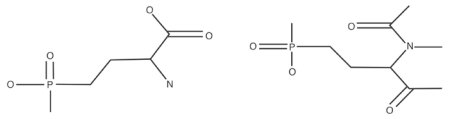


Method Conditions

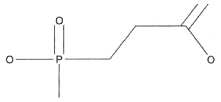
Column: **Cogent Diamond Hydride 2.δ™**, 2.2µm, 1 20Å
Catalog No.: 70200-05P-2
Dimensions: 2.1 x 50 mm
Mobile Phase:
A: DI H_2O/ 10mM ammonium acetate
B: 95% Acetonitrile / 5% DI water / 10mM ammonium acetate (v/v)

Gradient:

time (min.)	%B
0	90
1	90
1.2	5
5	5
6	90



Glufosinate N-acetyl Glufosinate



Glufosinate propanoic acid

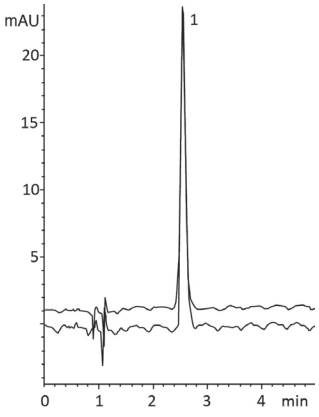
Post Time: 3 min
Injection vol.: 1 microL
Flow rate: 0.4 mL/min
Detection: ESI – NEG - Agilent 6210 MSD TOF mass spectrometer
Samples: Glufosinate (1720.64 ppm), N-acetylglufosinate (639.2 ppm), and glufosinate propanoic acid (1302.5 ppm) stock solutions were diluted 1:100 with 4:1 DI water: methanol.
Peak: 1. Glufosinate m/z 180.0431 $[M-H]^-$
2. N-acetyl Glufosinate m/z 222.00 $[M-H]^-$
3. Glufosinate Propanoic Acid m/z 151.00 $[M-H]^-$

Discussion

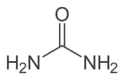
Analysis of these compounds can be problematic with other methods and poor peak shape may occur. In contrast, the peaks obtained with the Diamond Hydride 2.o™ column are very sharp and symmetrical. The column is a near-UHPLC phase and consequently efficiency is very good. The method can be applied to food products containing these types of compounds.

Urea by ANP LC-MS

Figure 75.



Overlay of runs from 2 column lots



Urea

Method Conditions

Column: **Cogent Diamond Hydride™**, 4µm, 1 00Å
Catalog No.: 70000-7.5P
Dimensions: 4.6 x 75mm
Mobile Phase: 5% DI H2O / 95% Acetonitrile/ 0.1% (v/v) trifluoroacetic acid (TFA)
Injection vol.: 1µL
Flow rate: 1.0mL/min
Detection: UV 205nm
Sample: 1mg/mL urea reference standard in diluent of 50% acetonitrile/ 50% DI water/ 0.1% TFA.
Peak: 1. Urea

Discussion

Urea is very difficult to retain by conventional HPLC methods. It is highly polar and therefore shows little or no reversed phase retention. On the other hand, it can be readily retained past the solvent front when using the Diamond Hydride™ column and a simple isocratic mobile phase. Furthermore, the peak shape for the compound is symmetrical and does not exhibit tailing or fronting. Data from two column lots is shown in the overlay, illustrating the lot-to-lot precision of the stationary phase.