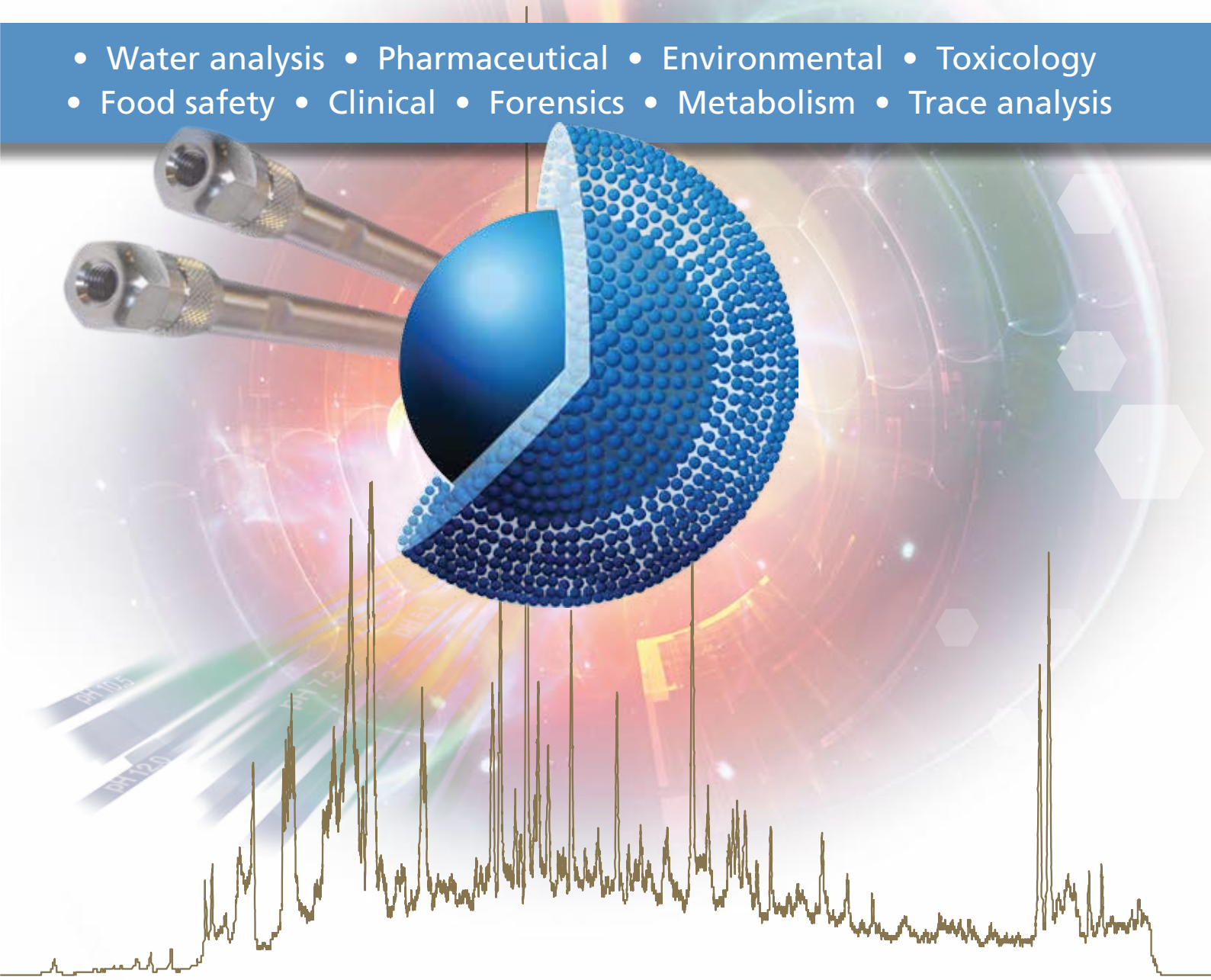
ACE® UltraCore™ SuperC18™

UHPLC / HPLC Columns Developed for

MASS SPECTROMETRY

• Water analysis • Pharmaceutical • Environmental • Toxicology
• Food safety • Clinical • Forensics • Metabolism • Trace analysis



- Ultra-inert 2.5µm and 5µm solid-core particles for sharp peaks and high MS signal sensitivity
- Ultra-low bleed profile for minimal background in all UV and MS applications
- Columns stable between pH 1.5 and pH 11 for maximum versatility
- Rapid analysis formats available including 0.5mm and 1.0mm id columns

ACE® UltraCore™
Solid-Core UHPLC / HPLC Columns for MS

ACE UltraCore SuperC18

Explore the advantages of ACE UltraCore SuperC18 for MS

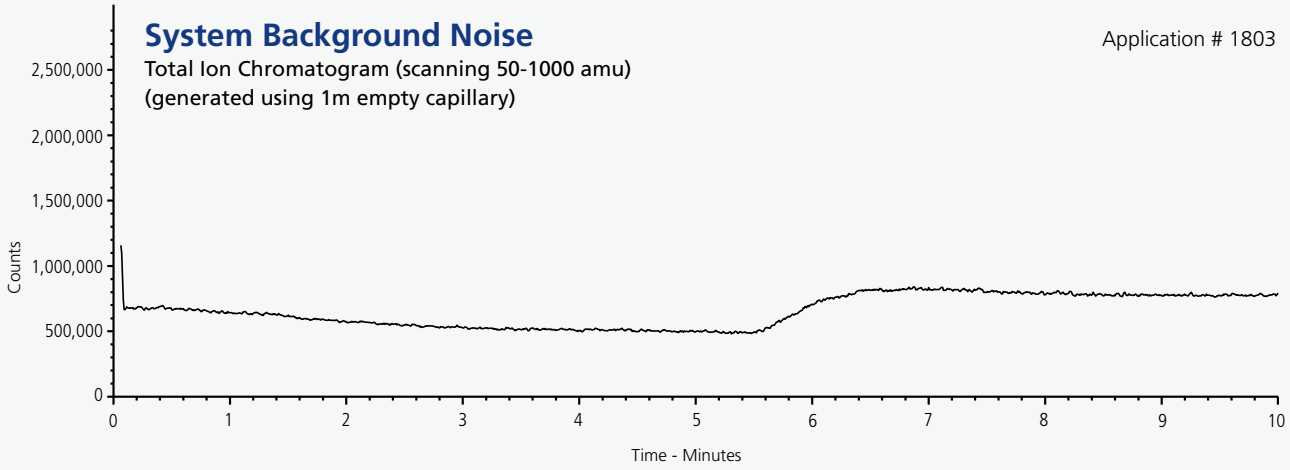
ACE UltraCore SuperC18 has been specifically designed for MS applications and is based on the high efficiency, low back pressure solid-core particles with our unique Encapsulated Bonding Technology (EBT™). This technology dramatically increases ligand coverage on the solid-core silica surface and consequently provides a number of key advantages for MS users.

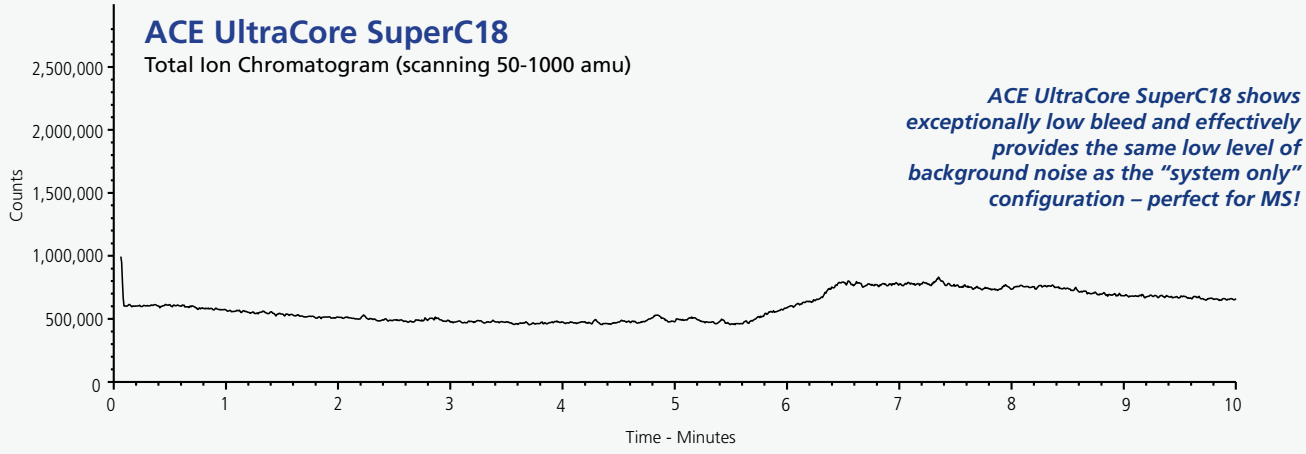
Advantage #1: Reduced Background Noise for MS

The proprietary Encapsulated Bonding Technology (EBT™) ensures ACE UltraCore SuperC18 columns are highly resistant to hydrolysis. The resulting highly stable phase contributes minimal background column bleed ensuring maximum MS response and intensity.

ACE UltraCore SuperC18 Columns Provide Exceptionally Low MS Bleed

- The following example compares bleed from a gradient analysis as a Total Ion Chromatogram detected by the MS with and without the presence of a highly stable ACE UltraCore SuperC18 column.





Column: ACE UltraCore SuperC18, 50 x 2.1mm, 5µm
Flow Rate: 0.60ml/min Temp: 40°C Detection: Agilent 1290B with 6150MSD, AJS-ES spray chamber
Mobile Phase A: 0.1% v/v HCOOH (aq)
Mobile Phase B: 0.1% v/v HCOOH in MeCN

Gradient: Time (mins)	0	0.2	6	10	10.5
%B	5	5	100	100	5

Advantage #2: Improved Peak Shape and MS Signal Intensity

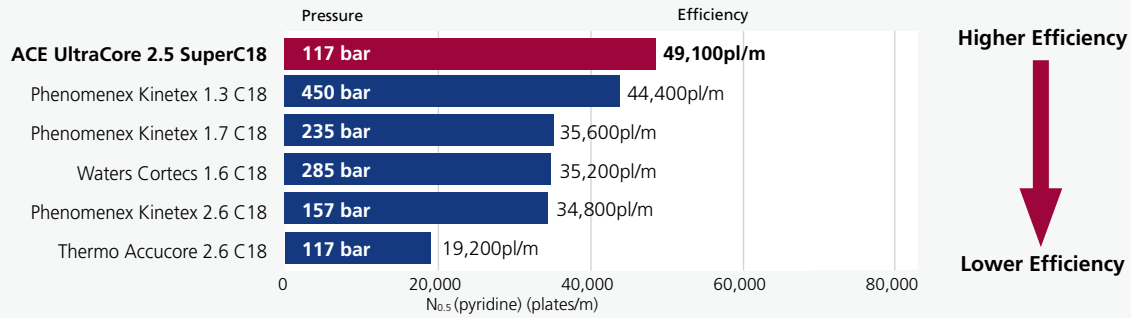
ACE UltraCore columns have earned a well deserved reputation for delivering highly efficient, symmetrical peak shapes even with the most challenging of molecules as illustrated by the following independent test. The use of a highly efficient column exhibiting minimal peak tailing will result in an improved MS signal response.

ACE UltraCore SuperC18 Provides Exceptional Efficiency

- Leading column brands from major manufacturers investigated
- Comparison of column efficiency for pyridine – a basic molecule

Peak Efficiency Comparison

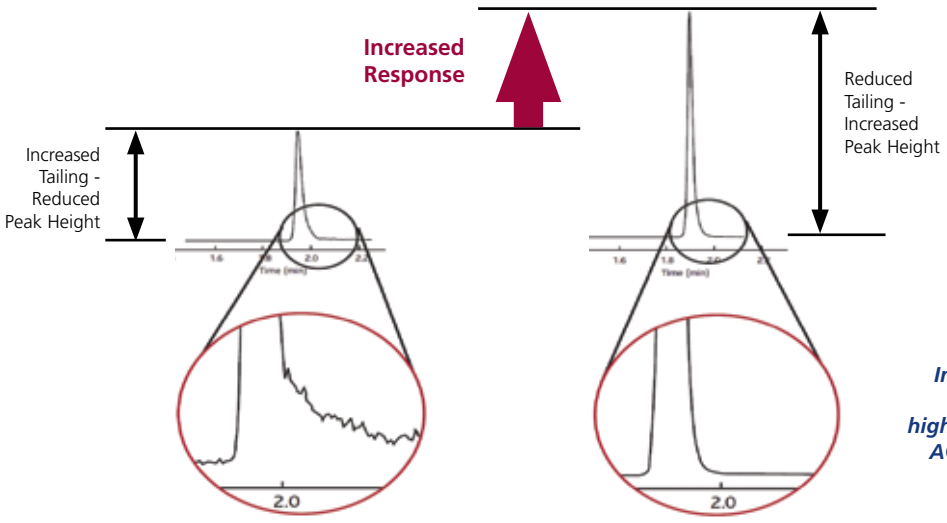
Reproduced with kind permission of The Open University, UK. Application # 1802



Column Dimensions: 50 x 2.1mm Sample: 1) uracil 2) pyridine 3) phenol
Mobile Phase: 30:70 (v/v) MeOH/10mM NH_4OAc in H_2O (pH 5.8) Flow Rate: 0.20ml/min Temperature: 22°C Wavelength: 254nm
Comparative data may not be representative of all applications. Please see back page for acknowledgement of trademarks.

Reduce Peak Tailing to Improve MS Signal Response

- Improved efficiency and peak shape has a direct effect upon signal response



Improve your MS signal response by selecting high efficiency, low tailing ACE UltraCore SuperC18 columns

Advantage #3: Exploit a Wider pH Operating Range

A further advantage of the proprietary Encapsulated Bonding Technology (EBT™) is the extended pH operating range compared to traditional C18 phases.

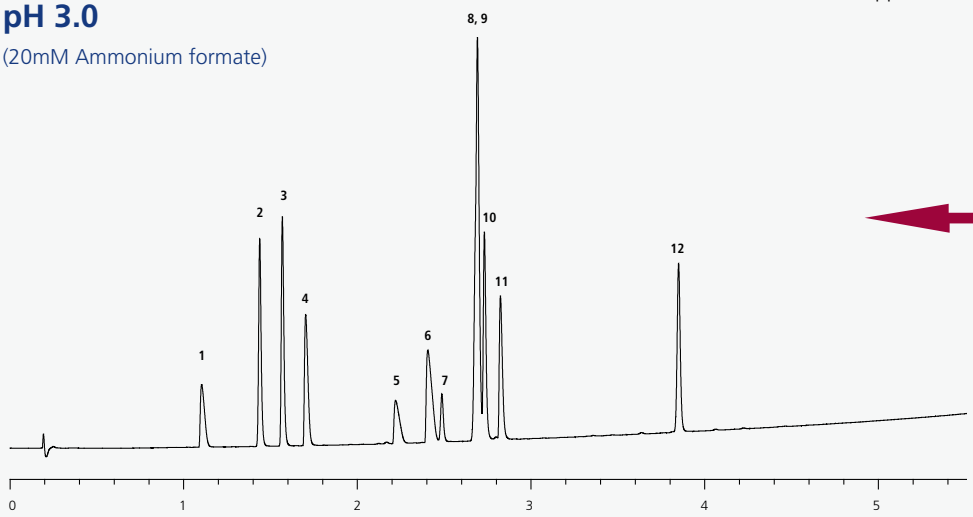
Highly stable ACE UltraCore SuperC18 columns can be used with MS compatible buffers from pH 1.5 – 11.0 to maximise both resolution and MS signal response.

Exploit Selectivity by Adjusting pH with MS Compatible Buffers

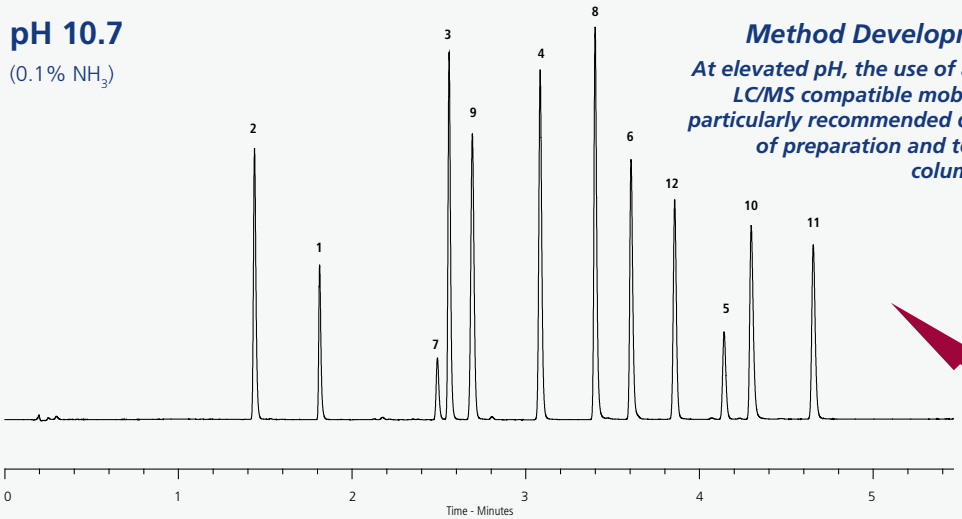
- Confidently develop methods at an eluent pH that maximises resolution and MS response
- Stable and rugged ACE UltraCore columns offer excellent column lifetimes across the pH range

Application # 1801

pH 3.0
(20mM Ammonium formate)



pH 10.7
(0.1% NH_3)



Method Development Tip:

At elevated pH, the use of a 0.1% NH_3 LC/MS compatible mobile phase is particularly recommended due to ease of preparation and to maximise column lifetime.

Column: ACE UltraCore SuperC18, 50 x 2.1mm, 2.5µm
Sample: 1) atenolol 2) methylphenylsulphoxide 3) eserine 4) prilocaine 5) bupivacaine 6) tetracaine
7) 1,2,3,4-tetrahydro-1-naphthol 8) carvedilol 9) nitrobenzene 10) methdilazine 11) amitriptyline 12) valerophenone
Temperature: 40°C Flow Rate: 0.60ml/min Wavelength: 254nm Gradient: 3 – 100% B in 5 minutes
Acidic Mobile Phase: A: 20mM ammonium formate in H_2O (pH 3.0) B: 20mM ammonium formate (pH 3.0) in 90:10 (v/v) MeCN/H_2O
Basic Mobile Phase: A: 0.1% v/v NH_3 (= 18mM) in H_2O (pH 10.7) B: 0.1% v/v NH_3 (=18mM), pH 10.7 in 90:10 (v/v) MeCN/H_2O

Use ACE UltraCore SuperC18 for MS Applications

Example #1 Low Level Determination of Multiple Pesticide Residues by LC/MS/MS

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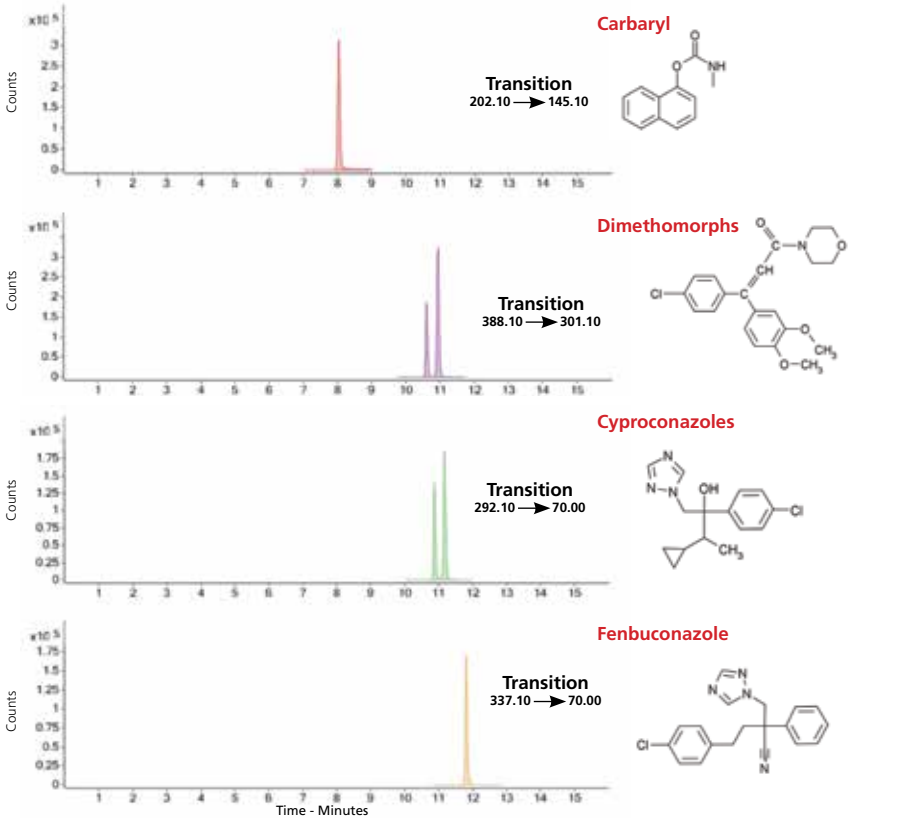
Application # 1804



Additional pesticides within the same analysis:

Acephate
Acetamiprid
Aldicarb
Aldicarb sulphone
Aldicarb sulphoxide
Benomyl
Carbendazim
Carbofuran
Clofentezine
Clothianidin
Cyfluthrin
Demeton S-methylsulphone
Demeton S-methylsulphoxide
Dicrotophos
Dimethoate
Dinotefuran
DMA
DMPF
Flubendiamide
Folpet
Formetanate
Hexaconazole
Hexaflumuron
Imidacloprid
Indoxacarb
Mandipropamid
Methamidophos
Methomyl
Monocrotophos
Nicotine
Omethoate
Oxamyl
Pencycuron
Prochloraz
Propargite
Thiabendazole
Thiacloprid
Thiamethoxam
Thiodicarb
Thiophanate methyl
Triforine

Visit www.ace-hplc.com for further MS application details

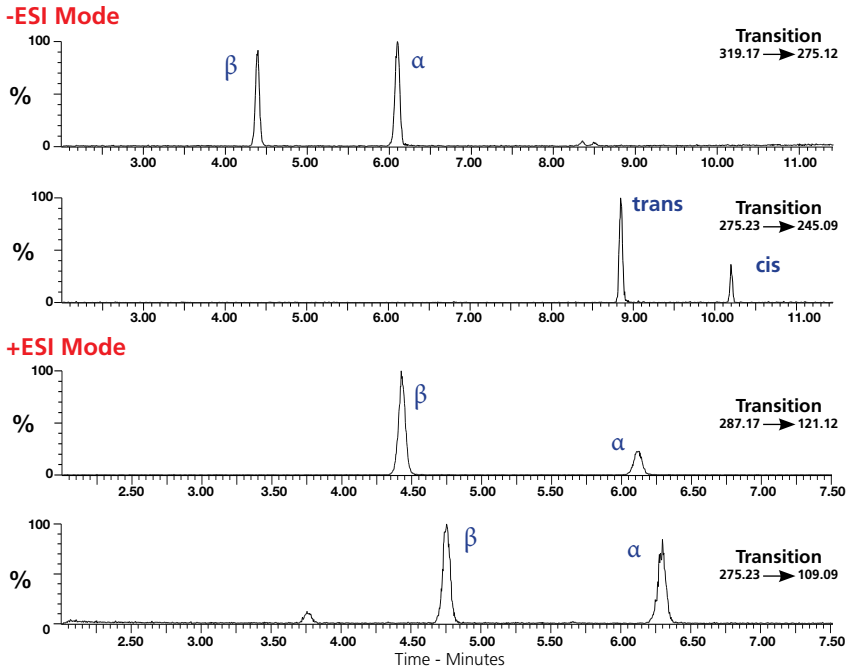
Column: ACE UltraCore SuperC18, 50 x 2.1mm, 2.5µm Temp: 40°C Flow Rate: 0.40ml/min Detection: Agilent 6420 triple quadrupole MS, ESI +ve mode, dynamic MRM
Mobile Phase A: 0.1% v/v HCOOH + 5mM ammonium formate in 10:90 v/v MeOH/H_2O Mobile Phase B: 0.1% v/v HCOOH + 5mM ammonium formate in 90:10 v/v MeOH/H_2O

Gradient: Time (mins)	0	1	15	18	18.05	20
%B	0	0	100	100	0	0

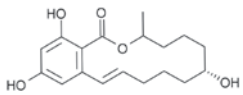
Example #2 Multiple Veterinary Steroids and Various Epimers by LC/MS/MS (with Positive/Negative Switching)

Reproduced with kind permission of The Food and Environment Research Agency, UK

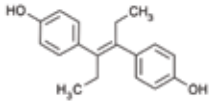
Application # 1805



α- and β-Zearalenol



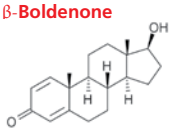
Diethylstilbestrol-d8



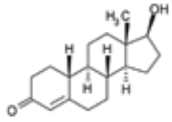
Additional –ve mode (-ESI) analytes:

Taleranol and zeranol-d4
Taleranol and zeranol
Zearalenone
Hexestrol
Diethylstilbesterol
Dienestrol

α- and β-Boldenone



α- and β-Nortestosterone



Additional +ve mode (+ESI) analytes:

Hydroxystanazolol
Hydroxystanazolol-d3
Methyltestosterone
Methyltestosterone-d3
β-Nortestosterone-d3
β-Trenbolone
α-Trenbolone

Visit www.ace-hplc.com for further MS application details

Column: ACE UltraCore SuperC18, 100 x 2.1mm, 2.5µm Flow Rate: 0.50ml/min Temp: 45°C Detection: Waters Xevo TQS MS, +ve or –ve mode as required, MRM data Mobile Phase A: 0.01mM NH_4F + 0.001% v/v HCOOH (aq) Mobile Phase B: MeCN

Gradient: Time (mins)	0	0.5	7	7.5	10.5
%B	25	25	35	35	60