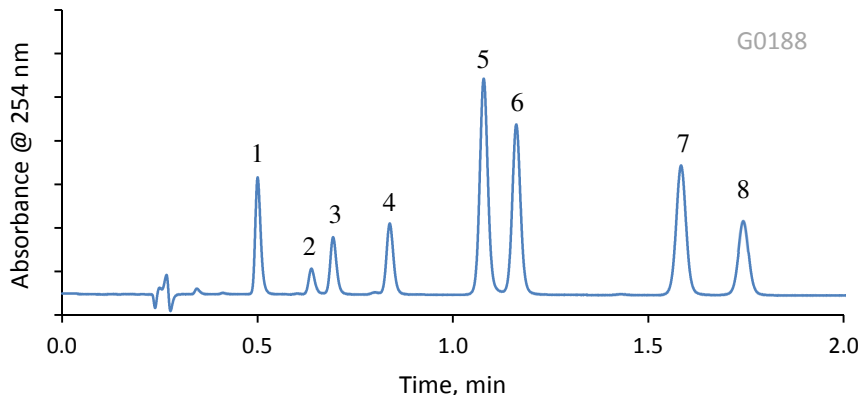


Application Note: 194-AB

Separation of Sulfonamides on HALO® 2 µm Biphenyl



PEAK IDENTITIES:

1. Sulfacetamide
2. Sulfadiazine
3. Sulfapyridine
4. Sulfamerazine
5. Sulfamethoxazole
6. Sulfamethazine
7. Sulfamethoxyipyridazine
8. Sulfachloropyridazine

TEST CONDITIONS:

Columns: HALO 90 Å Biphenyl, 2 µm, 2.1 x 50mm
Part Number: 91812-411

Mobile Phase A: Water, 0.1% Formic acid

Mobile Phase B: Acetonitrile, 0.1% Formic acid

Gradient:

Time	% B
0.0	15
2.0	20

Flow Rate: 0.5 mL/min

Initial Pressure: 257 bar

Temperature: 40°C

Detection: 254 nm, PDA

Injection Volume: 1 µL

Sample Solvent: Acetonitrile

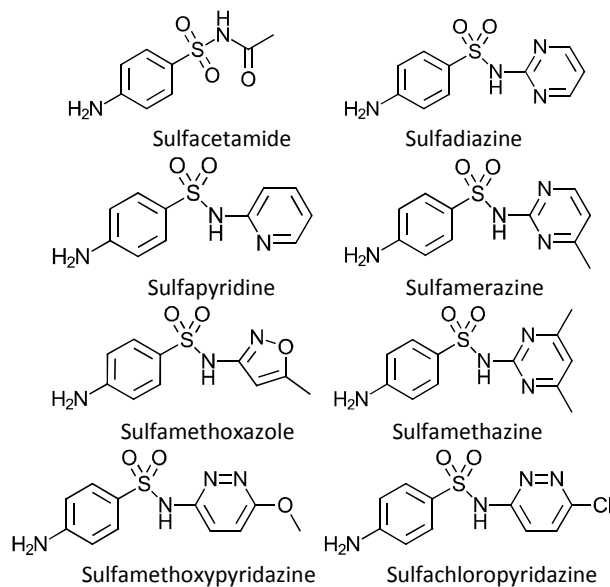
Data Rate: 100 Hz

Response Time: 0.025 sec.

Flow Cell: 1 µL

LC System: Shimadzu Nexera X2

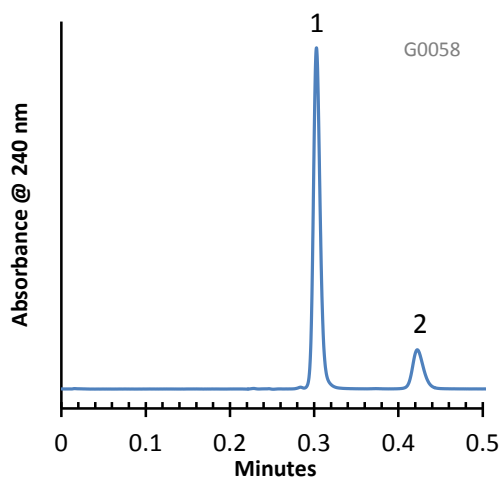
STRUCTURES:



A mixture of sulfonamides is separated on a HALO 90 Å Biphenyl, 2 µm column in less than 2 minutes. These synthetic drugs have several purposes, but are mainly used to treat bacterial infections such as urinary tract infections, eye infections, or ear infections. HALO Biphenyl shows increased retention compared to alkyl phases due to the enhanced interactions between the aromatic moieties of the sulfonamides and the biphenyl structure. These interactions also enable more retention of polar compounds on the HALO Biphenyl phase. When a complex mixture contains a variety of polar and non-polar compounds, use a HALO Biphenyl column as part of the method development screening.

HPLC Application Note: 075-AB

Separation of Amoxicillin and Ampicillin on HALO RP-Amide



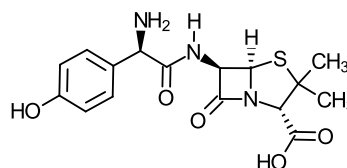
PEAK IDENTITIES:

1. Amoxicillin
2. Ampicillin

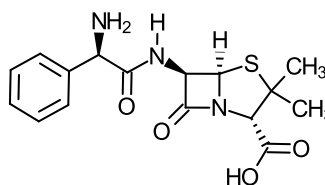
TEST CONDITIONS:

Column: 4.6 x 50 mm, HALO RP-Amide
Part Number: 92814-407
Mobile Phase: 82/18: A/B
A= 0.02 M Phosphate buffer, pH=2.7
B= Acetonitrile
Flow Rate: 2.0 mL/min.
Pressure: 200 Bar
Temperature: 30°C
Detection: UV 240 nm, VWD
Injection Volume: 1.0 µL
Sample Solvent: 80/20: water/acetonitrile
Response Time: 0.02 sec.
Flow Cell: 2.5 µL semi-micro
LC System: Shimadzu Prominence UFLC XR
ECV: ~14 µL

STRUCTURES:



Amoxicillin

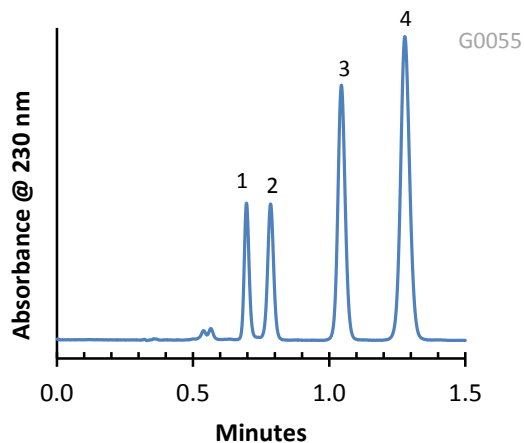


Ampicillin

This chromatogram shows a time-efficient separation of two weakly retained antibiotics on a short HALO RP-Amide column.

HPLC Application Note: 72-AB

Separation of Penicillins on HALO Phenyl-Hexyl



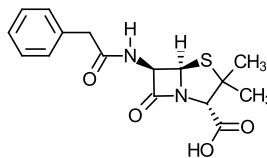
PEAK IDENTITIES:

1. Penicillin G
2. Piperacillin
3. Oxacillin
4. Cloxacillin

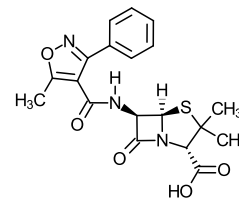
TEST CONDITIONS:

Column: 4.6 x 50 mm, HALO Phenyl-Hexyl
Part Number: 92814-406
Mobile Phase: 40/60: A/B
A= 0.02 M Phosphate buffer, pH=3.0 (adj.)
B= Methanol
Flow Rate: 1.5 mL/min.
Pressure: 200 Bar
Temperature: 40°C
Detection: UV 230 nm, VWD
Injection Volume: 1.0 µL
Sample Solvent: 50/50 Water/acetonitrile
Response Time: 0.02 sec.
Flow Cell: 2.5 µL semi-micro
LC System: Shimadzu Prominence UFLC XR
ECV: about 14 µL

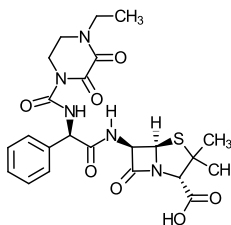
STRUCTURES:



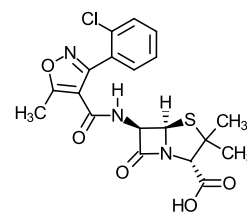
Penicillin G



Oxacillin



Piperacillin

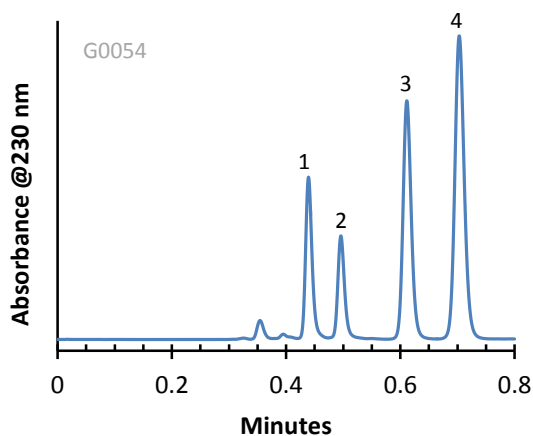


Cloxacillin

These four penicillin drugs can be rapidly separated on HALO Fused-Core Phenyl-Hexyl bonded phase columns.

HPLC Application Note: 71-AB

Separation of Penicillins on HALO ES-CN



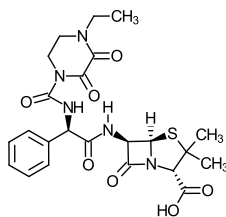
PEAK IDENTITIES:

1. Piperacillin
2. Penicillin G
3. Oxacillin
4. Cloxacillin

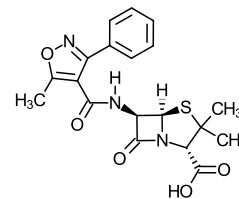
TEST CONDITIONS:

Column: 4.6 x 50 mm, HALO ES-CN
Part Number: 92814-404
Mobile Phase: 55/45: A/B
A= 0.02 M Phosphate buffer, pH=3.0 (adj.)
B= Acetonitrile
Flow Rate: 1.5 mL/min.
Pressure: 120 Bar
Temperature: 40°C
Detection: UV 230 nm, VWD
Injection Volume: 1.0 µL
Sample Solvent: 50/50:Water/acetonitrile
Response Time: 0.02 sec.
Flow Cell: 2.5 µL semi-micro
LC System: Shimadzu Prominence UFLC XR
ECV: about 14 µL

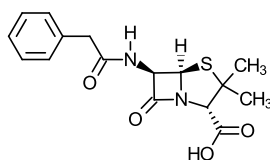
STRUCTURES:



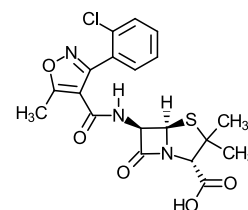
Piperacillin



Oxacillin



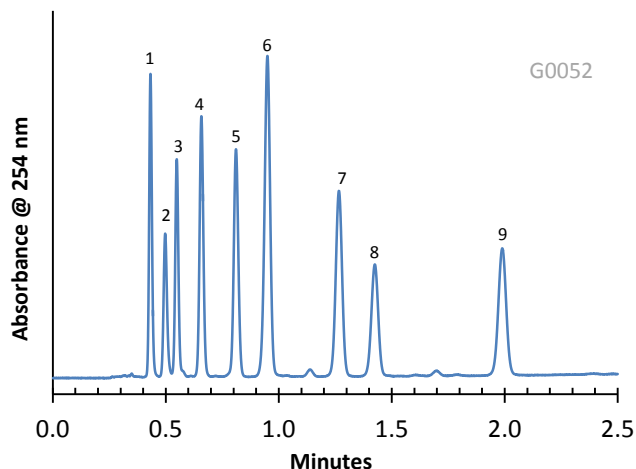
Penicillin G



Cloxacillin

These four penicillin drugs can be rapidly separated on HALO Fused-Core ES-CN bonded phase columns.

Separation of Cephalosporins on HALO ES-CN



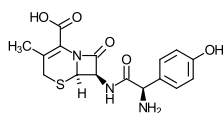
PEAK IDENTITIES:

1. Cefadroxil
2. Ceftazidime
3. Cefaclor
4. Cephalexin
5. Cephadrine
6. Cefotaxime
7. Cefoxitin
8. Cefazolin
9. Cephalothin

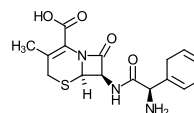
TEST CONDITIONS:

Columns: HALO ES-CN, 4.6 x 50 mm
 Part Numbers 92814-404
 Mobile Phase: A= 0.02 M Phosphate buffer, pH=2.7 (adj.)
 B= Methanol
 Gradient: 20% B to 40% B in 2.5 min.
 Flow Rate: 2.0 mL/min.
 Pressure: 225 bar at start of gradient
 Temperature: 40° C
 Detection: UV 254 nm, VWD
 Injection Volume: 1.0 µL
 Sample Solvent: 70/30 Water/Methanol
 Response Time: 0.02 sec.
 Flow Cell: 2.5 µL semi-micro
 LC System: Shimadzu Prominence UFLC XR
 ECV: about 14 µL

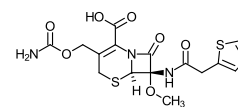
STRUCTURES:



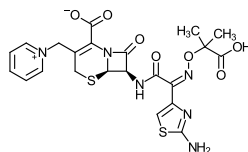
Cefadroxil



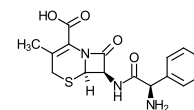
Cephalexin



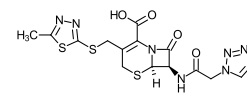
Cefoxitin



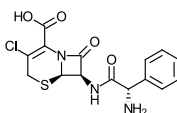
Ceftazidime



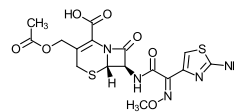
Cephadrine



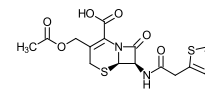
Cefazolin



Cefaclor



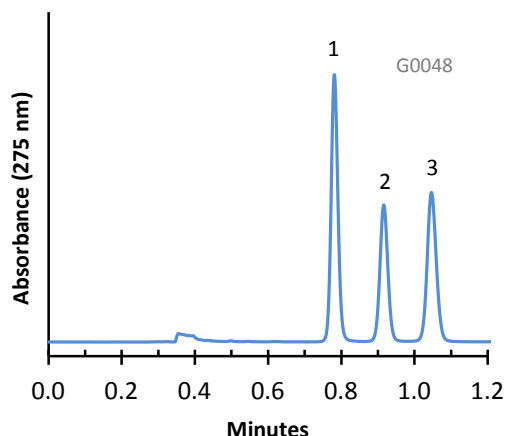
Cefotaxime



Cephalothin

These cephalosporins can be rapidly separated by reversed-phase HPLC on a HALO Fused-Core ES-CN bonded phase column.

Separation of Fluoroquinolone Drugs on HALO Phenyl-Hexyl Phase



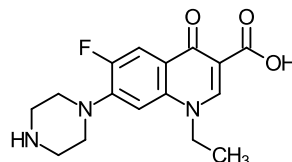
PEAK IDENTITIES:

1. Norfloxacin
2. Ciprofloxacin
3. Lomefloxacin

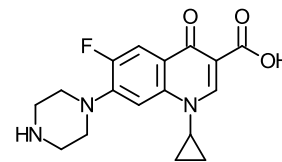
TEST CONDITIONS:

Column: 4.6 x 50 mm, HALO Phenyl-Hexyl
Part Number: 92814-406
Mobile Phase: 82/18: A/B
A= 0.025 M Sodium phosphate, pH=2.5 (adj.)
B= Acetonitrile
Flow Rate: 1.5 mL/min.
Pressure: 170 Bar
Temperature: 30°C
Detection: UV 275 nm, VWD
Injection Volume: 0.3 µL
Sample Solvent=Dimethylformamide/Acetonitrile
Response Time: 0.02 sec.
Flow Cell: 2.5 µL semi-micro
LC System: Shimadzu Prominence UFLC XR
ECV: ~14 µL

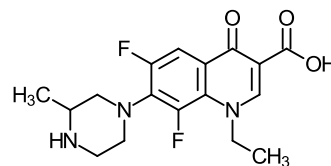
STRUCTURES:



Norfloxacin



Ciprofloxacin

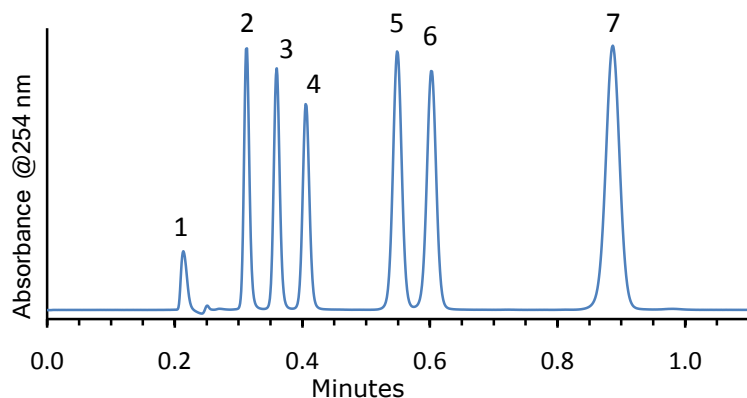


Lomefloxacin

The fluoroquinolone drugs can be quickly separated on HALO Phenyl-Hexyl stationary phase in less than 1.2 minutes.

Application Note: 011-AB

Separation of Sulfa Drugs on HALO RP-Amide



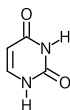
PEAK IDENTITIES:

1. Uracil
2. Sulfathiazole
3. Sulfamerazine
4. Sulfamethizole
5. Sulfachloropyridazine
6. Sulfamethoxazole
7. Sulfadimethoxine

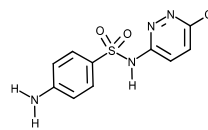
TEST CONDITIONS:

Column: 4.6 x 50 mm, HALO RP-Amide
 Part Number: 92814-407
 Mobile Phase: 70/30 A/B
 A=0.1% formic acid with 0.005 M ammonium formate (pH=3.0)
 B= acetonitrile
 Flow Rate: 2.0 mL/min.
 Pressure: 193 Bar
 Temperature: 35°C
 Detection: UV 254 nm, VWD
 Injection Volume: 0.5 µL
 Sample Solvent: methanol
 Response Time: 0.02 sec.
 Flow Cell: 2.5 µL semi-micro
 LC System: Shimadzu Prominence UFLC-XR
 Extra column volume: ~14 µL

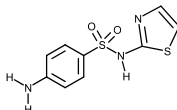
STRUCTURES:



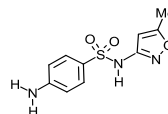
Uracil



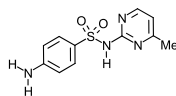
Sulfachloropyridazine



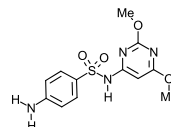
Sulfathiazole



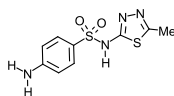
Sulfamethoxazole



Sulfamerazine



Sulfadimethoxine



Sulfamethizole