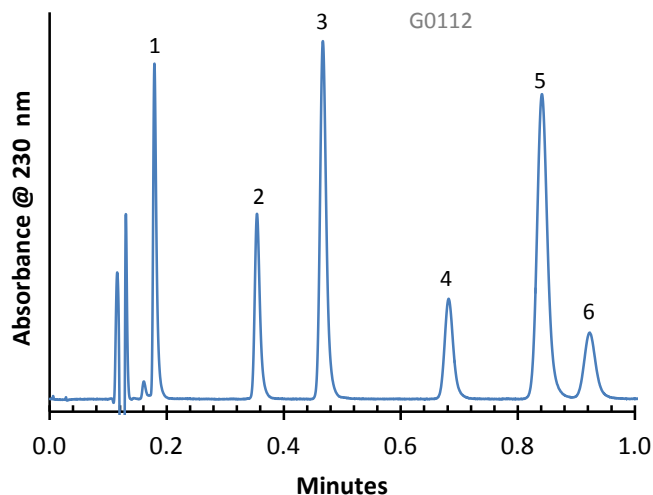


Application Note: 128-NS

NSAIDs Separation on HALO 2 ES-CN with MS Compatible Mobile Phase



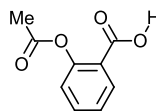
PEAK IDENTITIES:

1. Aspirin
2. Tolmetin
3. Naproxen
4. Fenoprofen
5. Ibuprofen
6. Diclofenac

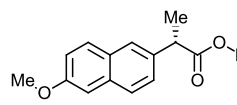
TEST CONDITIONS:

Column: 3.0 x 50 mm, HALO 2 ES-CN
 Part Number: 91813-404
 Mobile Phase: 60/40-A/B
 A= Water with 0.1% formic acid/
 10 mM ammonium formate, pH 3.3
 B= 80/20 Acetonitrile/Water with 0.1%
 formic acid/10 mM ammonium formate
 Flow Rate: 2.0 mL/min.
 Pressure: 440 bar
 Temperature: 45 °C
 Detection: UV 230 nm, PDA
 Injection Volume: 1 µL
 Sample Solvent: Water/methanol
 Data Rate: 80 Hz
 Response Time: 0.02 sec.
 Flow Cell: 2 µL micro cell
 LC System: Agilent 1200 SL

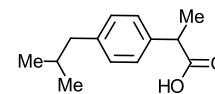
STRUCTURES:



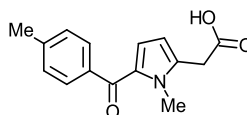
Aspirin



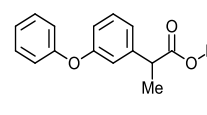
Naproxen



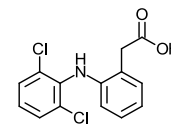
Ibuprofen



Tolmetin



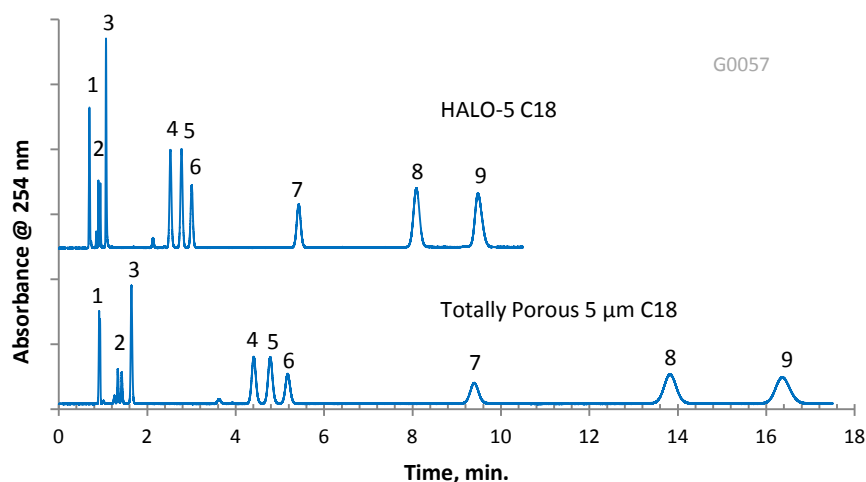
Fenoprofen



Diclofenac

Six NSAIDs are separated on a HALO 2 ES-CN column using a MS compatible mobile phase in less than 1 minute with symmetrical peak shapes.

Separation of NSAIDs on HALO-5 and Totally Porous 5 µm



PEAK IDENTITIES:

1. Acetaminophen
2. Aspirin
3. Salicylic acid
4. Tolmetin
5. Ketoprofen
6. Naproxen
7. Fenopropfen
8. Diclofenac
9. Ibuprofen

TEST CONDITIONS:

Columns: 4.6 x 150 mm, HALO-5 C18 (Part number: 95814-702) and a 4.6 x 150 mm, 5 µm totally porous C18 column

A = 20 mM Potassium phosphate, pH 2.5

B = 50/50 (v/v) Acetonitrile/methanol

Composition: 48/52: A/B

Flow Rate: 2.0 mL/min.

Pressure: 240 bar on HALO-5 C18

215 bar on totally porous 5 µm

Temperature: 30 °C

Detection: UV 254 nm, VWD

Injection Volume: 2 µL

Sample Solvent: 50:50 Methanol/water

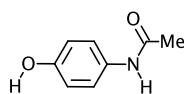
Response Time: 0.02 sec.

Flow Cell: 2.5 µL, semi-micro

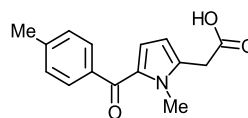
LC System: Shimadzu Prominence UFLC XR

Extracolumn volume: ~14 µL

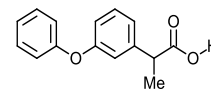
STRUCTURES:



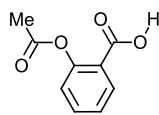
Acetaminophen



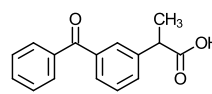
Tolmetin



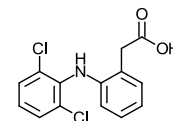
Fenopropfen



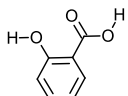
Aspirin



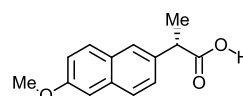
Ketoprofen



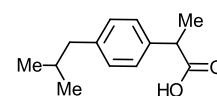
Diclofenac



Salicylic acid



Naproxen

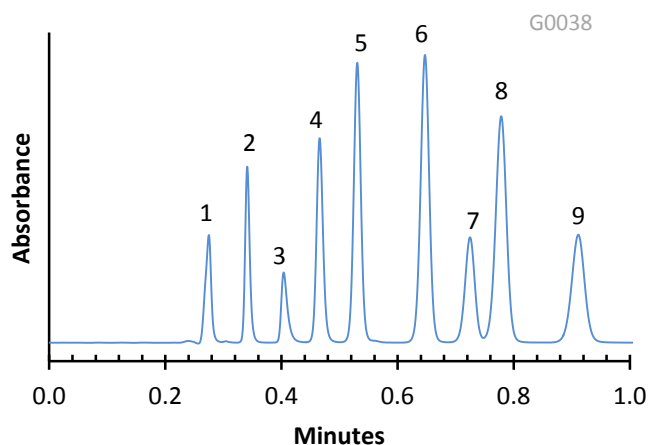


Ibuprofen

The HALO-5 column separates this mixture of NSAIDs (non-steroidal anti-inflammatory drugs) in less than 60% of the time and with better resolution than a typical HPLC column packed with totally porous, 5-micron particles.

Application Note: 56-NS

Isocratic Separation of NSAIDs on HALO ES-CN Phase



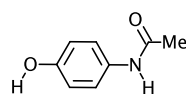
PEAK IDENTITIES:

1. Acetaminophen
2. Aspirin
3. Salicylic acid
4. Tolmetin
5. Naproxen
6. Fenoprofen
7. Ibuprofen
8. Diclofenac
9. Mefenamic acid

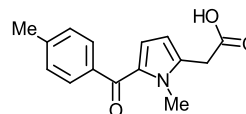
TEST CONDITIONS:

Column: 4.6 x 50 mm, HALO ES-CN
 Part Number: 92814-404
 Mobile Phase: 50/50-A/B
 A= 0.02 M potassium phosphate buffer, pH=2.5
 B=Acetonitrile
 Flow Rate: 2.0 mL/min.
 Pressure: 165 Bar
 Temperature: 35 °C
 Detection: UV 230 nm, VWD
 Injection Volume: 0.5 µL
 Sample Solvent: Water/methanol
 Response Time: 0.02 sec.
 Flow Cell: 2.5 µL semi-micro
 LC System: Shimadzu Prominence UFLC XR
 Extra column volume: ~14 µL

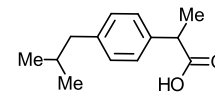
STRUCTURES:



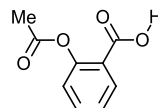
Acetaminophen



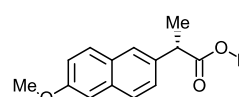
Tolmetin



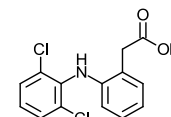
Ibuprofen



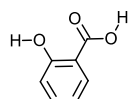
Aspirin



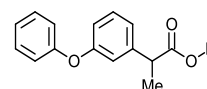
Naproxen



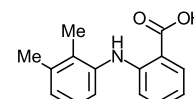
Diclofenac



Salicylic acid



Fenoprofen

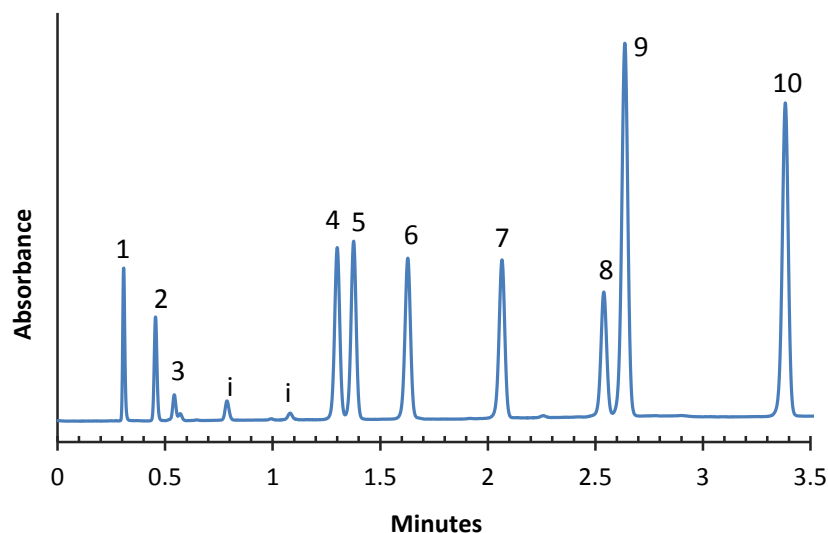


Mefenamic acid

This separation illustrates the separating power of HALO Fused-Core stationary phases. Nine NSAID drugs are separated in under one minute on a 50 mm HALO ES-CN column.

Application Note: 016-NS

Gradient Separation of NSAIDs on HALO RP-Amide



PEAK IDENTITIES:

1. Acetaminophen
 2. Aspirin
 3. Salicylic acid
 4. Tolmetin
 5. Ketoprofen
 6. Naproxen
 7. Fenoprofen
 8. Ibuprofen
 9. Diclofenac
 10. Mefenamic acid
- i=impurity

TEST CONDITIONS:

Column: 4.6 x 50 mm, HALO RP-Amide, 2.7 μ m

Part Number: 92814-407

Mobile Phase: 50/50-- A/B (start)

A= 0.02 M sodium phosphate buffer, pH=2.5

B= methanol

Gradient:

0.0 min 50%B

0.1 min 50%B

0.5 min 55%B

3.5 min 80%B

4.0 min 80%B

Flow Rate: 2.0 mL/min.

Pressure: 289 Bar

Temperature: 35°C

Detection: UV 254 nm, VWD

Injection Volume: 1.0 μ L

Sample Solvent: mobile phase

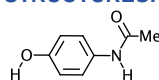
Response Time: 0.02 sec.

Flow Cell: 2.5 μ L semi-micro

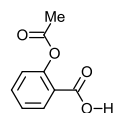
LC System: Shimadzu Prominence UFLC XR

Extra column volume: ~14 μ L

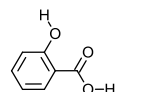
STRUCTURES:



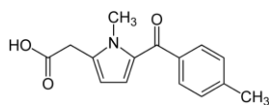
Acetaminophen



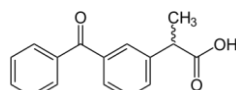
Aspirin



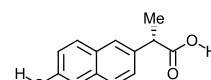
Salicylic acid



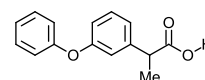
Tolmetin



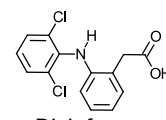
Ketoprofen



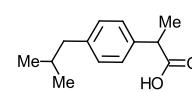
Naproxen



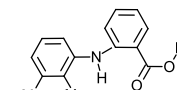
Fenoprofen



Diclofenac



Ibuprofen

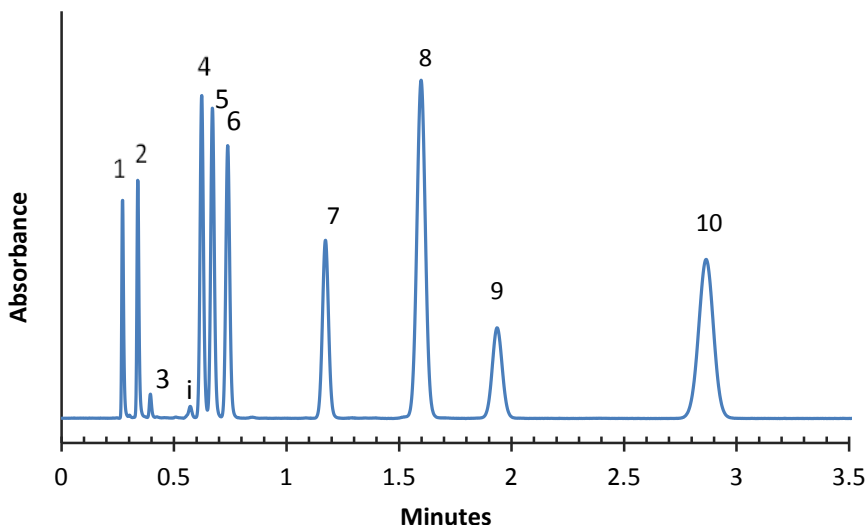


Mefenamic acid

Ten non-steroidal anti-inflammatory drugs (NSAIDs) can be separated in under 3.5 minutes using a short HALO RP-Amide 2.7 μ m packed column.

Application Note: 015-NS

Separation of NSAIDs on HALO C8



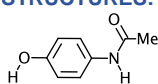
PEAK IDENTITIES:

1. Acetaminophen
 2. Aspirin
 3. Salicylic acid
 4. Tolmetin
 5. Ketoprofen
 6. Naproxen
 7. Fenoprofen
 8. Diclofenac
 9. Ibuprofen
 10. Mefenamic acid
- i=impurity

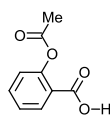
TEST CONDITIONS:

Column: 4.6 x 50 mm, HALO C8, 2.7µm
 Part Number: 92814-408
 Mobile Phase: 35/65-- A/B
 A= 0.02 M sodium phosphate buffer, pH=2.5
 B= methanol
 Flow Rate: 2.0 mL/min.
 Pressure: 277 Bar
 Temperature: 35°C
 Detection: UV 254 nm, VWD
 Injection Volume: 1.0 µL
 Sample Solvent: mobile phase
 Response Time: 0.02 sec.
 Flow Cell: 2.5 µL semi-micro
 LC System: Shimadzu Prominence UFLC XR
 Extra column volume ~14 µL

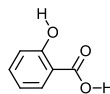
STRUCTURES:



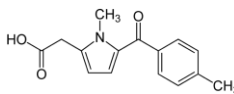
Acetaminophen



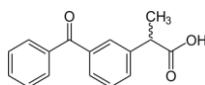
Aspirin



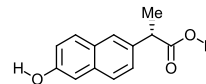
Salicylic acid



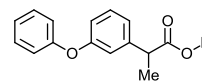
Tolmetin



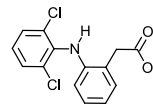
Ketoprofen



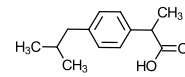
Naproxen



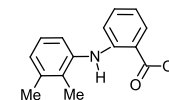
Fenoprofen



Diclofenac



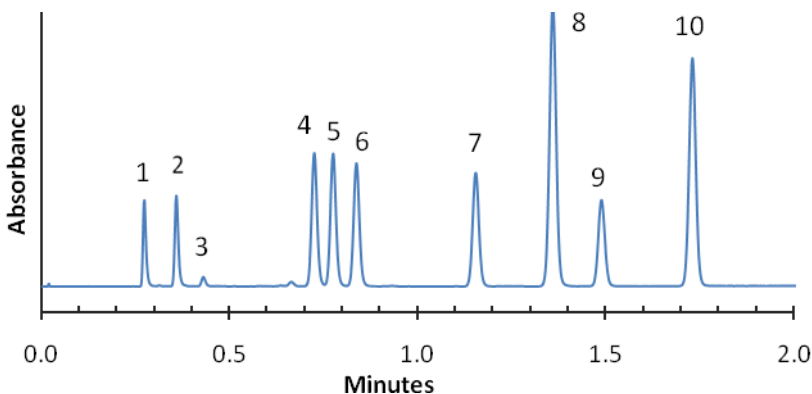
Ibuprofen



Mefenamic acid

Application Note: 14-NS

Gradient Separation of NSAIDs on HALO C8



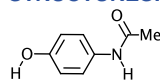
PEAK IDENTITIES:

1. Acetaminophen
2. Aspirin
3. Salicylic acid
4. Tolmetin
5. Ketoprofen
6. Naproxen
7. Fenopfen
8. Diclofenac
9. Ibuprofen
10. Mefenamic acid

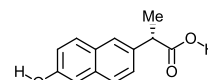
TEST CONDITIONS:

Column: 4.6 x 50 mm, HALO C8
 Part Number: 92814-408
 Mobile Phase: 38/62-- A/B (start)
 A= 0.02 M sodium phosphate buffer, pH=2.5
 B= methanol
 Gradient:
 0.0 min 62%B
 0.1 min 62%B
 2.0 min 85%B
 Flow Rate: 2.0 mL/min.
 Pressure: 286 Bar
 Temperature: 35°C
 Detection: UV 254 nm, VWD
 Injection Volume: 1.0 µL
 Sample Solvent: mobile phase
 Response Time: 0.02 sec.
 Flow Cell: 2.5 µL semi-micro
 LC System: Shimadzu Prominence UFLC XR
 ECV: ~14 µL

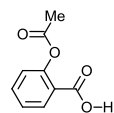
STRUCTURES:



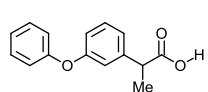
Acetaminophen



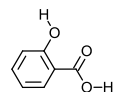
Naproxen



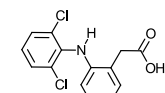
Aspirin



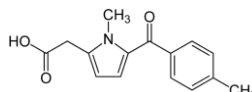
Fenopfen



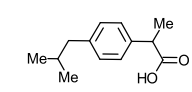
Salicylic acid



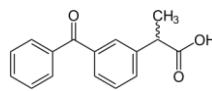
Diclofenac



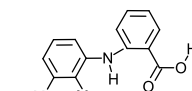
Tolmetin



Ibuprofen



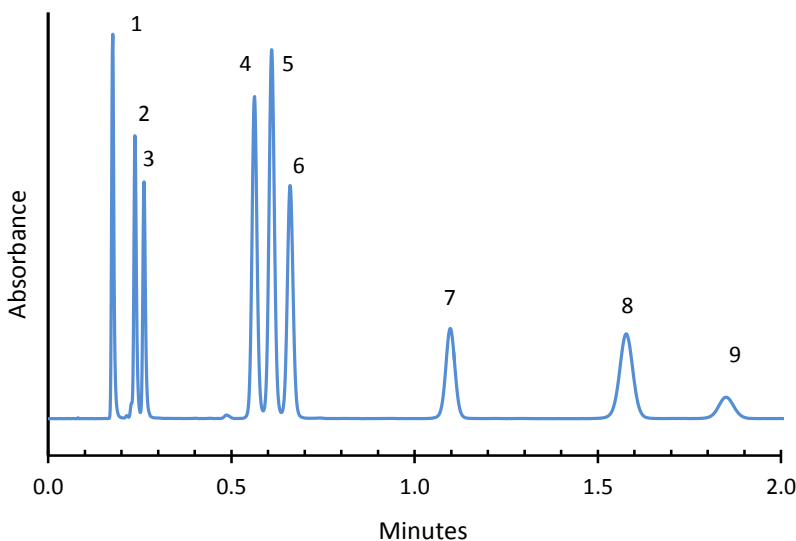
Ketoprofen



Mefenamic acid

Application Note: 013-NS

Isocratic Separation of NSAIDs on HALO C18



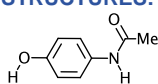
PEAK IDENTITIES:

1. Acetaminophen
2. Aspirin
3. Salicylic acid
4. Tolmetin
5. Ketoprofen
6. Naproxen
7. Fenoprofen
8. Diclofenac
9. Ibuprofen

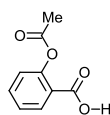
TEST CONDITIONS:

Column: 4.6 x 50 mm, HALO C18
 Part Number: 92814-402
 Mobile Phase: 43/57 A/B
 A= 0.02 M sodium phosphate buffer, pH=2.5
 B=(methanol/ACN)-50/50
 Flow Rate: 3.0 mL/min.
 Pressure: 338 Bar
 Temperature: 35°C
 Detection: UV 254 nm, VWD
 Injection Volume: 1.0 µL
 Sample Solvent: methanol/ water-50/50
 Response Time: 0.02 sec.
 Flow Cell: 2.5 µL semi-micro
 LC System: Shimadzu Prominence UFLC XR
 Extra column volume: ~14 µL

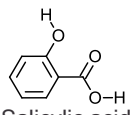
STRUCTURES:



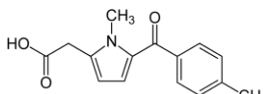
Acetaminophen



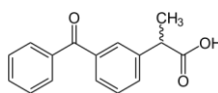
Aspirin



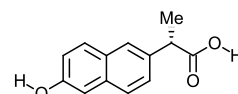
Salicylic acid



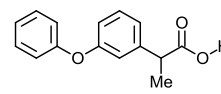
Tolmetin



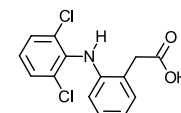
Ketoprofen



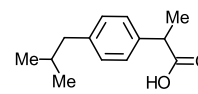
Naproxen



Fenoprofen



Diclofenac



Ibuprofen