

HALO[®]

BIPHENYL

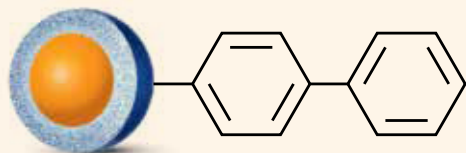
SAY HELLO TO ENHANCED
RETENTION, SELECTIVITY AND EFFICIENCY.



HALO 90 Å BIPHENYL

SELECTIVITY, EFFICIENCY AND RETENTION packed into one powerful new phase

The HALO Biphenyl offers a new perspective on retention mechanisms for polar compounds. With a combination of hydrophobic, aromatic, and polar selectivities, the HALO Biphenyl, joined with the efficiency of robust Fused-Core® technology, unlocks powerful separation forces. Experience the difference one phase can make!

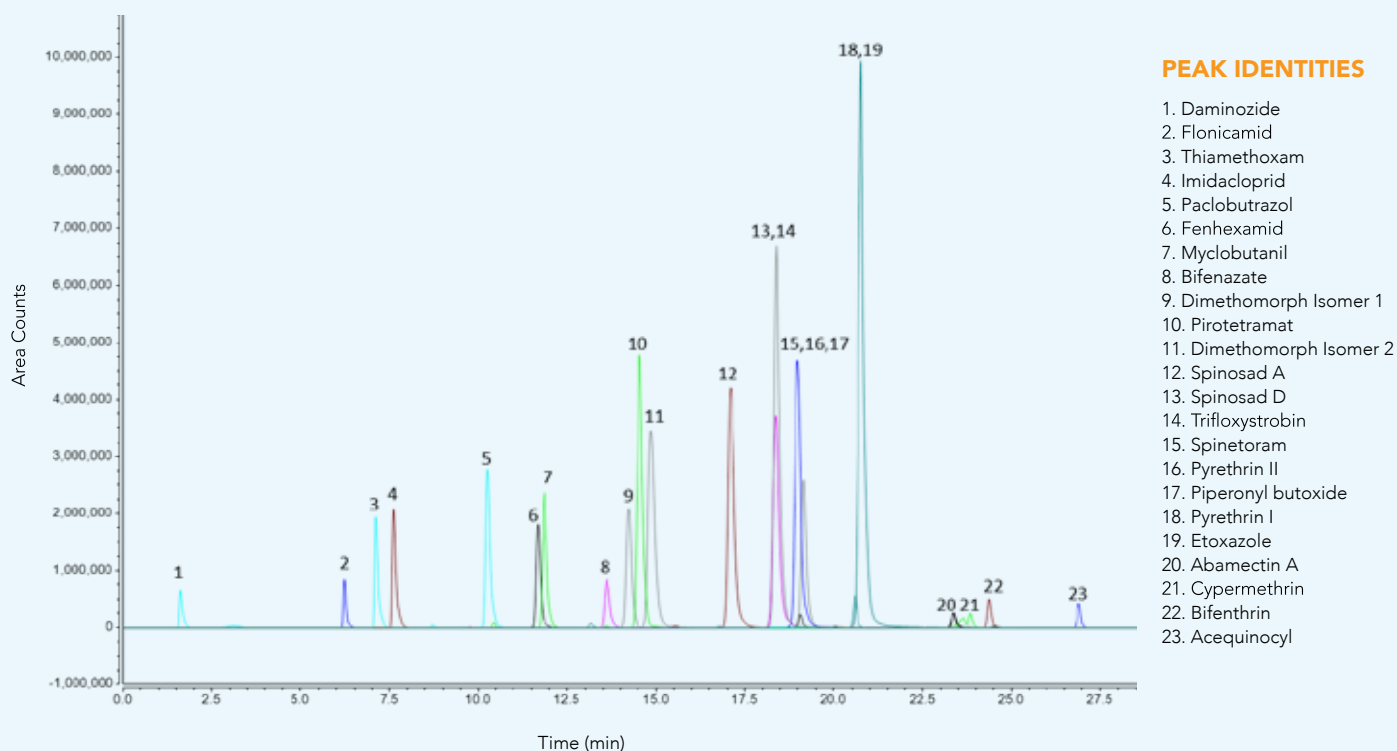


ADVANTAGES OF THE NEW HALO BIPHENYL

- Enhanced retention, high sensitivity, and increased efficiencies without sacrifice to robustness or reproducibility
- Increased selectivity for challenging polar compounds
- High efficiency resulting in sharp resolved peaks with excellent peak shapes

CHALLENGING SEPARATIONS REQUESTED

Figure 1. The HALO Biphenyl is ready for the challenge of complex samples. Both polar and non-polar pesticides are well resolved with this commonly required test for cannabis.



TEST CONDITIONS

Column: HALO 90Å Biphenyl, 2.7 μ m,
2.1 x 100 mm
Flow Rate: 0.2 mL/min
Injection Volume: 1 μ L
Sample Solvent: Nevada Pesticide Mix
Detection: MS-TOF, ESI+, XIC

Mobile Phase: A= Water/0.1% formic acid/4 mM
ammonium formate
B= Acetonitrile/0.1% formic acid/4 mM
ammonium formate

Gradient:	Time (min.)	%B
	0.00	0
	1.01	15
	4.00	35
	5.00	62
	30.00	100
	34.00	100

ENHANCED RETENTION WITH ALTERNATE SELECTIVITY

Figure 2. Selectivity comparisons are demonstrated between the HALO Biphenyl and HALO C18 on this common 13 opiate pain panel screening used by clinical laboratories.

TEST CONDITIONS

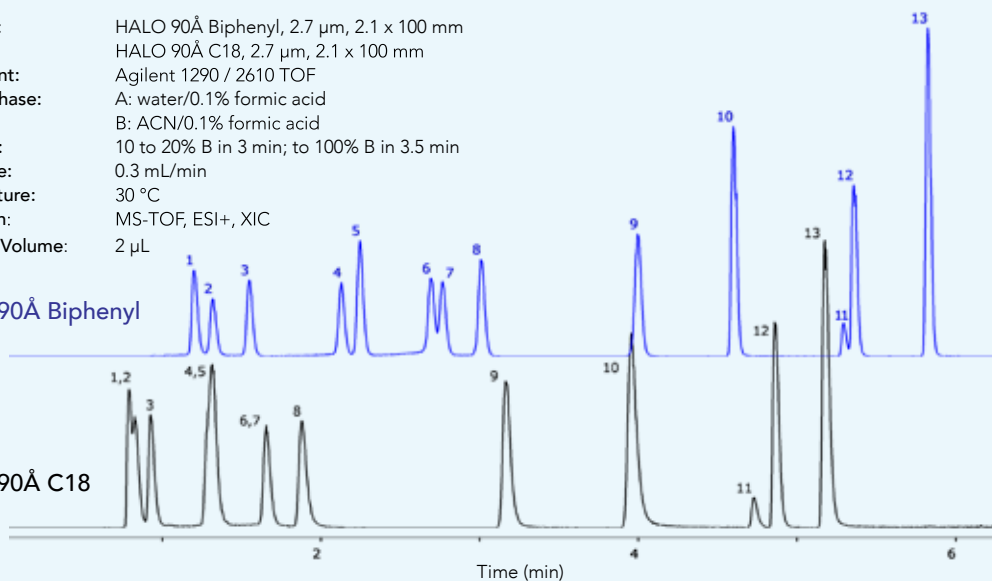
Columns: HALO 90Å Biphenyl, 2.7 µm, 2.1 x 100 mm
 HALO 90Å C18, 2.7 µm, 2.1 x 100 mm
 Instrument: Agilent 1290 / 2610 TOF
 Mobile Phase: A: water/0.1% formic acid
 B: ACN/0.1% formic acid
 Gradient: 10 to 20% B in 3 min; to 100% B in 3.5 min
 Flow Rate: 0.3 mL/min
 Temperature: 30 °C
 Detection: MS-TOF, ESI+, XIC
 Injection Volume: 2 µL

PEAK IDENTITIES

1. Morphine
2. Oxycodone
3. Hydromorphone
4. Naloxone
5. Codeine
6. Naltrexone
7. Oxycodone
8. Hydrocodone
9. cis-Tramadol HCl
10. Meperidine
11. Fentanyl
12. Buprenorphine
13. (±)-Methadone

HALO 90Å Biphenyl

HALO 90Å C18

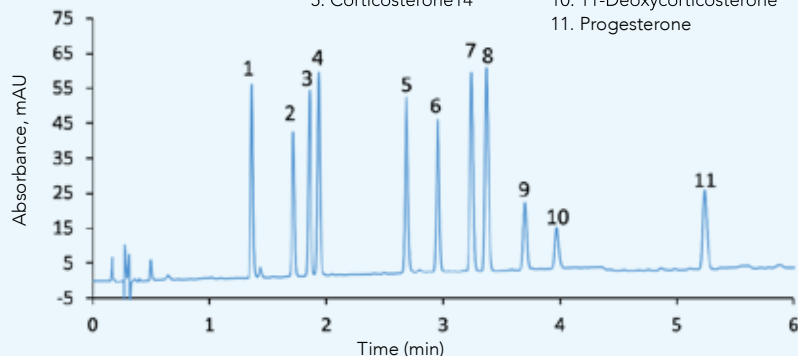


HIGH RESOLUTION SEPARATIONS

Figure 3. The sharp, fully resolved peaks demonstrate excellent peak shape in this high efficiency steroid separation.

PEAK IDENTITIES

1. Estrilol
2. Hydrocortisone
3. Prednisone
4. Cortisone
5. Corticosterone
6. β-Estradiol
7. Cortisone Acetate
8. Testosterone
9. 17-α-Hydroxyprogesterone
10. 11-Deoxycorticosterone
11. Progesterone



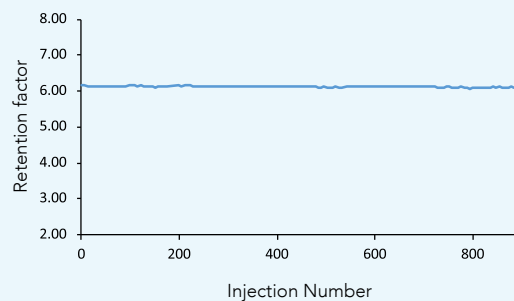
TEST CONDITIONS

Column: HALO 90Å Biphenyl, 2.7 µm, 4.6 x 50mm
 Instrument: Shimadzu Nexera X2
 Mobile Phase A: Water
 Mobile Phase B: Acetonitrile
 Gradient: 20-60% B in 6 minutes
 Flow Rate: 1.85 mL/min
 Temperature: 30°C
 Detection: UV 215 nm, PDA
 Injection Volume: 4 µL

QUALITY YOU CAN COUNT ON

Figure 4. Built to perform! The HALO Biphenyl provides robust column lifetimes.

Ruggedness after 900 injections as demonstrated with a 0.29% RSD



TEST CONDITIONS

Column: HALO 90Å Biphenyl, 2.7 µm 2.1x100 mm
 Mobile Phase: 60/40 Methanol/ H₂O, 0.1% Formic Acid, 10mM Ammonium Formate
 Temperature: 35°C
 Flow Rate: 0.6 mL/min
 Detection: 254 nm
 Injection Volume: 0.5 µL
 Sample: Naphthalene

PART NUMBERS

ANALYTICAL COLUMNS

90 Å, 2.7 µm

Dimensions: ID x Length (in mm)	Biphenyl
2.1 x 20	92812-211
2.1 x 30	92812-311
2.1 x 50	92812-411
2.1 x 75	92812-511
2.1 x 100	92812-611
2.1 x 150	92812-711
2.1 x 250	92812-911
3.0 x 20	92813-211
3.0 x 30	92813-311
3.0 x 50	92813-411
3.0 x 75	92813-511
3.0 x 100	92813-611
3.0 x 150	92813-711
3.0 x 250	92813-911
4.6 x 20	92814-211
4.6 x 30	92814-311
4.6 x 50	92814-411
4.6 x 75	92814-511
4.6 x 100	92814-611
4.6 x 150	92814-711
4.6 x 250	92814-911
10.0 x 50	92810-411
10.0 x 75	92810-511
10.0 x 100	92810-611
10.0 x 150	92810-711

CAPILLARY COLUMNS

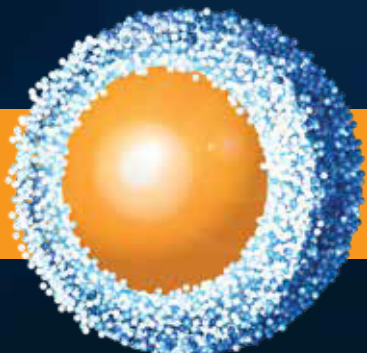
90 Å, 2.7 µm

Dimensions: ID x Length (in mm)	Biphenyl
0.075 x 50	98219-411
0.075 x 100	98219-611
0.075 x 150	98219-711
0.1 x 50	98218-411
0.1 x 100	98218-611
0.1 x 150	98218-711
0.2 x 50	98217-411
0.2 x 100	98217-611
0.2 x 150	98217-711
0.3 x 50	98216-411
0.3 x 100	98216-611
0.3 x 150	98216-711
0.5 x 50	98215-411
0.5 x 100	98215-611
0.5 x 150	98215-711
1.0 x 30	92811-311
1.0 x 50	92811-411
1.0 x 75	92811-511
1.0 x 100	92811-611
1.0 x 150	92811-711

GUARD COLUMNS

2.7 µm, 90 Å Guard columns, 3-pack

Dimensions: ID x Length (in mm)	Biphenyl
2.1 x 5	92812-111
3.0 x 5	92813-111
4.6 x 5	92814-111
Guard Column Holder	92814-111



MAC-MOD Analytical is an authorized distributor of HALO columns.

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