

# HALO<sup>®</sup>

## BIPHENYL

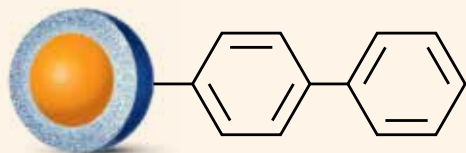
SAY HELLO TO ENHANCED  
RETENTION, SELECTIVITY AND EFFICIENCY.



# 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!

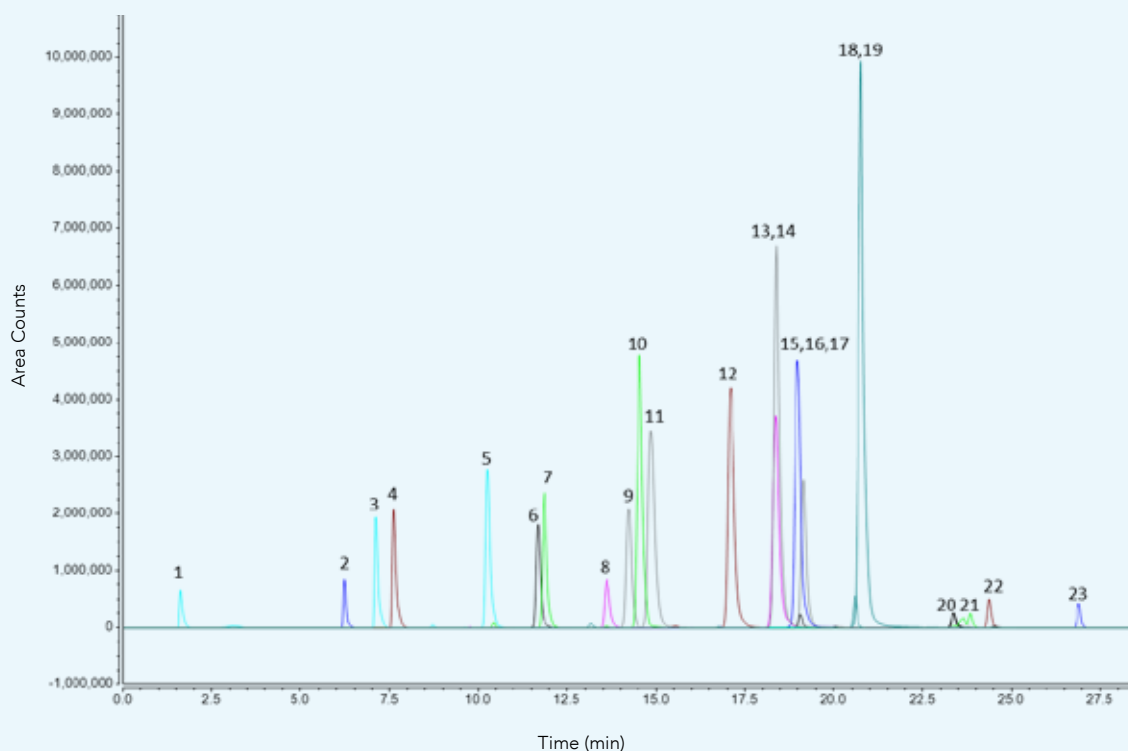


## ADVANTAGES OF THE NEW HALO BIPHENYL

- 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.



### PEAK IDENTITIES

1. Daminozide
2. Flonicamid
3. Thiamethoxam
4. Imidacloprid
5. Pacllobutrazol
6. Fenhexamid
7. Myclobutanil
8. Bifenazate
9. Dimethomorph Isomer 1
10. Pirotetramat
11. Dimethomorph Isomer 2
12. Spinosad A
13. Spinosad D
14. Trifloxystrobin
15. Spinetoram
16. Pyrethrin II
17. Piperonyl butoxide
18. Pyrethrin I
19. Etoxazole
20. Abamectin A
21. Cypermethrin
22. Bifenthrin
23. Acequinocyl

### TEST CONDITIONS

Column: HALO 90Å Biphenyl, 2.7 µm,  
2.1 x 100 mm  
Flow Rate: 0.2 mL/min  
Injection Volume: 1 µL  
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

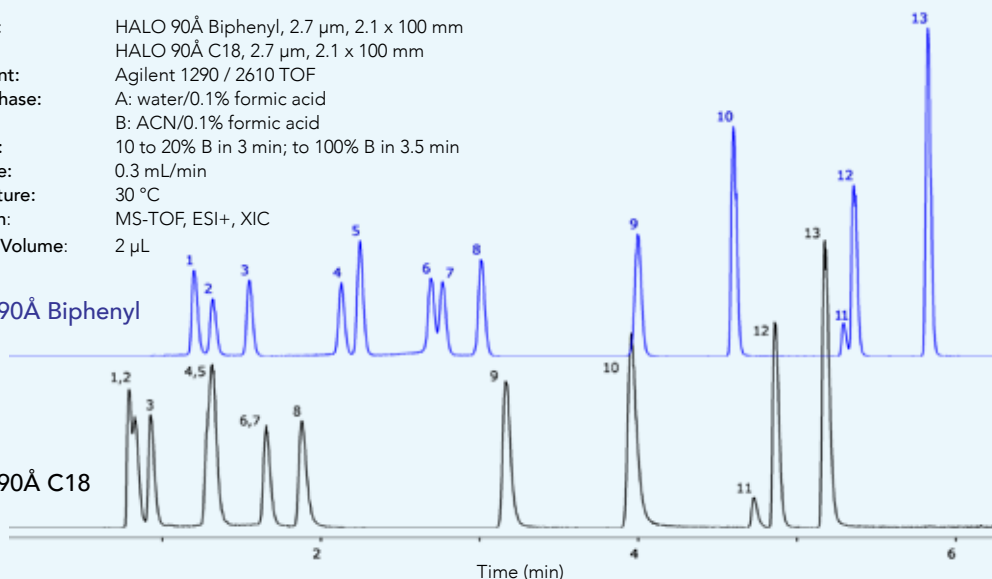
Columns: HALO 90Å Biphenyl, 2.7  $\mu\text{m}$ , 2.1 x 100 mm  
 HALO 90Å C18, 2.7  $\mu\text{m}$ , 2.1 x 100 mm  
 Instrument: Agilent 1290 / 2610 TOF  
 Mobile Phase: A: water/0.1% formic acid  
 B: ACN/0.1% formic acid  
 Gradient: 10 to 20% B in 3 min; to 100% B in 3.5 min  
 Flow Rate: 0.3 mL/min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

### 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. ( $\pm$ )-Methadone

HALO 90Å Biphenyl

HALO 90Å C18

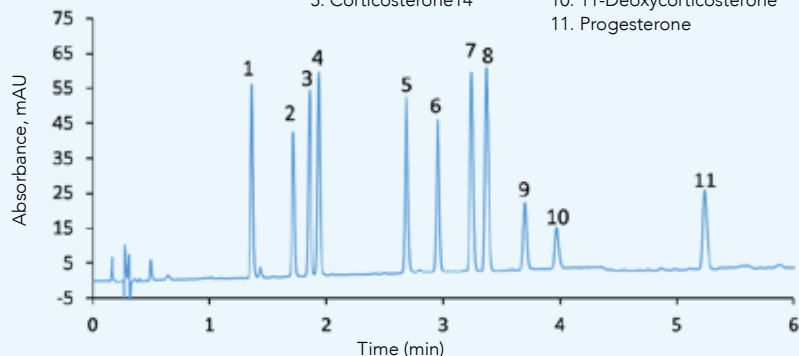


## HIGH RESOLUTION SEPARATIONS

**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.  $\beta$ -Estradiol
7. Cortisone Acetate
8. Testosterone
9. 17- $\alpha$ -Hydroxyprogesterone
10. 11-Deoxycorticosterone
11. Progesterone



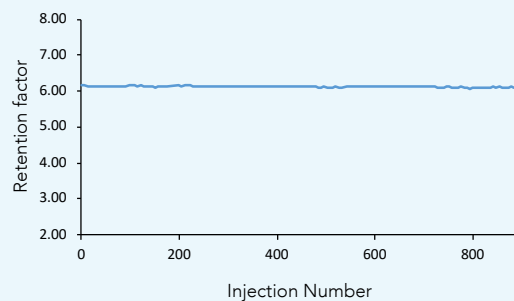
### TEST CONDITIONS

Column: HALO 90Å Biphenyl, 2.7  $\mu\text{m}$ , 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  $\mu\text{L}$

## 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  $\mu\text{m}$  2.1x100 mm  
 Mobile Phase: 60/40 Methanol/ H<sub>2</sub>O, 0.1% Formic Acid, 10mM Ammonium Formate  
 Temperature: 35°C  
 Flow Rate: 0.6 mL/min  
 Detection: 254 nm  
 Injection Volume: 0.5  $\mu\text{L}$   
 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

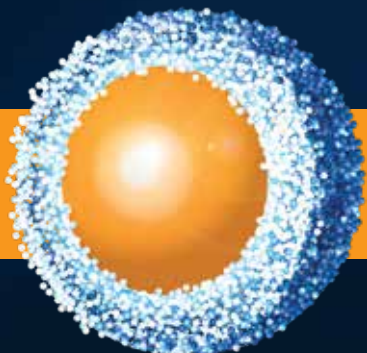
90 Å, 2.7 µm

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



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