

HALO[®]

BIPHENYL

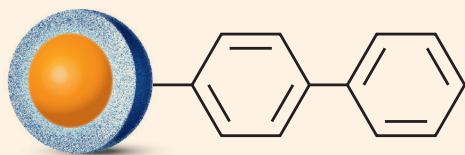
SAY HELLO TO ENHANCED
RETENTION, SELECTIVITY AND EFFICIENCY.



HALO[®] 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!

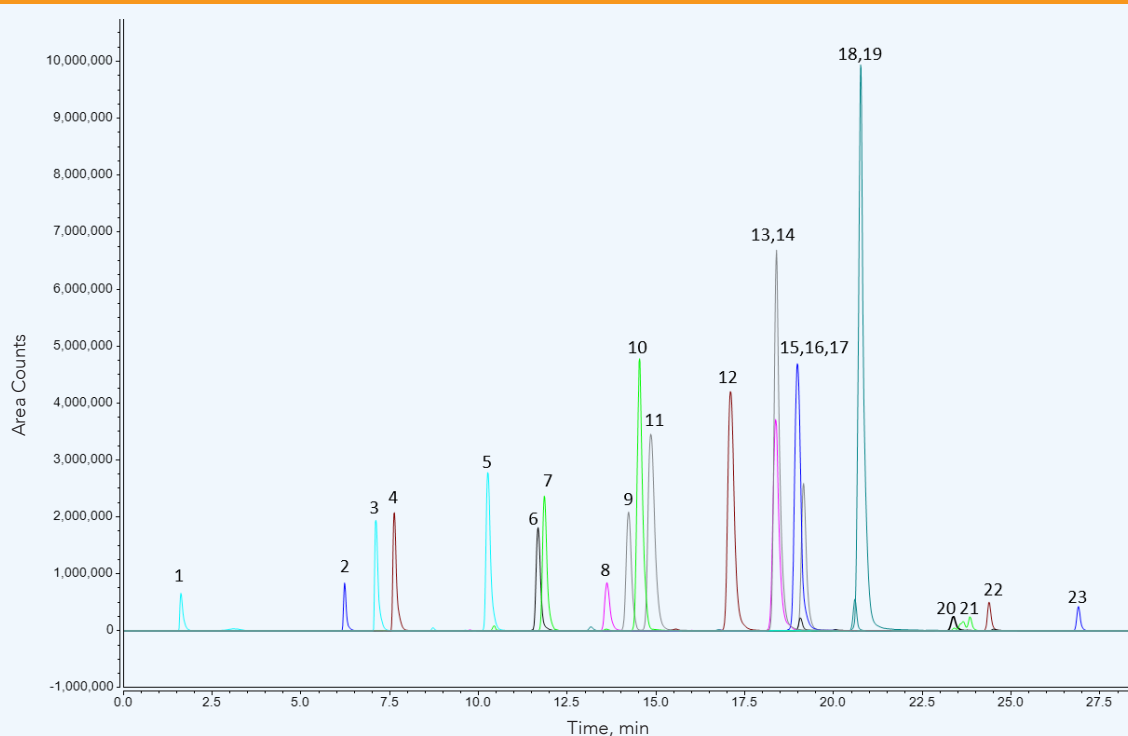


ADVANTAGES OF THE NEW HALO[®] BIPHENYL

- 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

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. Paclobotrazol
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 90 Å Biphenyl, 2.7 μ m, 2.1 x 100 mm

Mobile Phase A: water/0.1% formic acid/4 mM ammonium formate

Mobile Phase B: ACN/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

Flow Rate: 0.2 mL/min

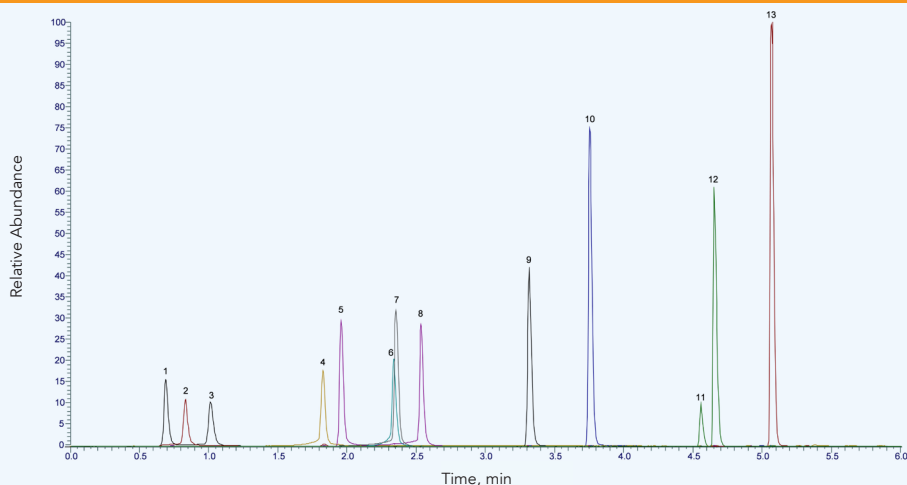
Injection Volume: 1 μ L

Sample Solvent: Nevada Pesticide Mix

Detection: MS-TOF, ESI+, XIC

FAST LC-MS SEPARATION OF OPIATES

The 2 μm HALO® Biphenyl is well suited for high throughput analysis of drug panels. In this separation of an opiate pain panel, isobaric species are well separated. Note the resolution between peaks 1 and 3 (morphine, hydromorphone) and peaks 5 and 8 (codeine, hydrocodone).



PEAK IDENTITIES

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

TEST CONDITIONS

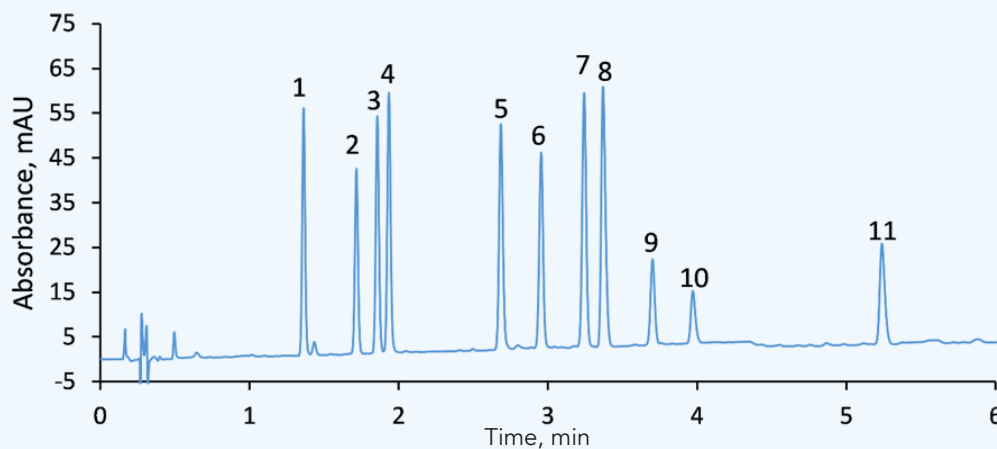
Column: HALO 90 Å Biphenyl, 2 μm , 2.1 x 50 mm
Mobile Phase A: water/0.1% formic acid
Mobile Phase B: ACN/0.1% formic acid

Gradient:	Time	% B
	0	10
	2.2	20
	5.0	60
	5.5	60

Flow Rate: 0.4 mL/min
Temperature: 40 °C
Injection Volume: 1 μL
Instrument: Shimadzu Nexera X2 coupled to Thermo Q Exactive HF
Detection: MS

HIGH RESOLUTION SEPARATION OF STEROIDS

Sharp, fully resolved peaks with excellent peak shape are demonstrated in this high efficiency steroid separation using a 2.7 μm particle size which is amenable to both HPLC and UHPLC conditions.



PEAK IDENTITIES

1. Estriol
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

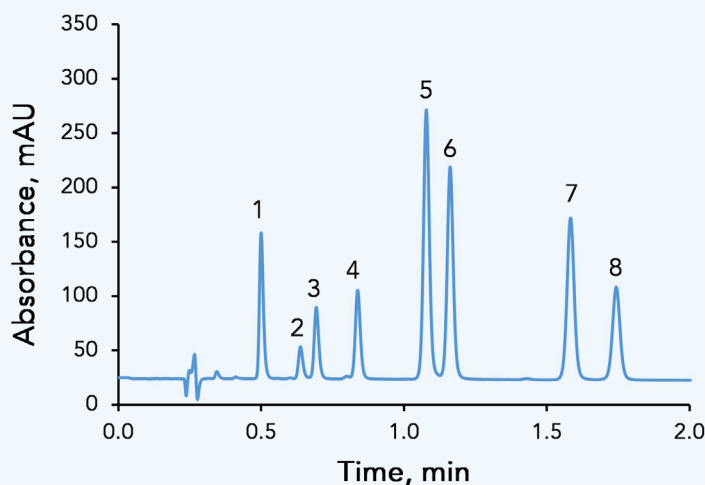
TEST CONDITIONS

Column: HALO 90 Å Biphenyl, 2.7 μm , 4.6 x 50 mm
Mobile Phase A: water
Mobile Phase B: ACN
Gradient: 20-60% B in 6 minutes
Flow Rate: 1.85 mL/min

Temperature: 30 °C
Injection Volume: 4 μL
Instrument: Shimadzu Nexera X2
Detection: 215 nm, PDA

HIGH THROUGHPUT SULFONAMIDE SEPARATION

A mixture of sulfonamides is separated on a 2 μm HALO[®] Biphenyl in less than 2 minutes. These synthetic drugs have several purposes, but are mainly used to treat bacterial 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.



TEST CONDITIONS

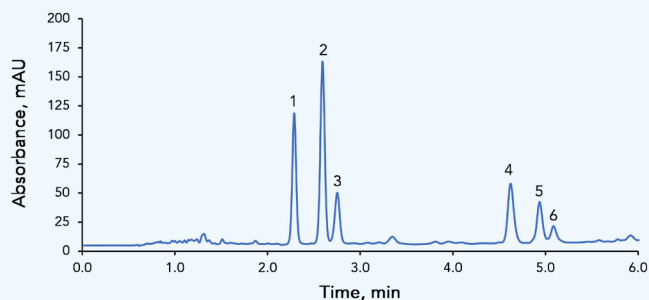
Column: HALO 90 Å Biphenyl, 2 μm , 2.1 x 50 mm
 Mobile Phase A: water/0.1% formic acid
 Mobile Phase B: ACN/0.1% formic acid
 Gradient: 15-20% B in 2 min
 Flow Rate: 0.5 mL/min
 Temperature: 40 °C
 Injection Volume: 1 μL
 Instrument: Shimadzu Nexera X2
 Detection: 254 nm, PDA

PEAK IDENTITIES

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

HOP ACIDS ANALYSIS

This separation of alpha and beta acids of hops using a 5 μm HALO[®] Biphenyl column is ideal for bitterness flavor profiling used by the brewing industry.



PEAK IDENTITIES

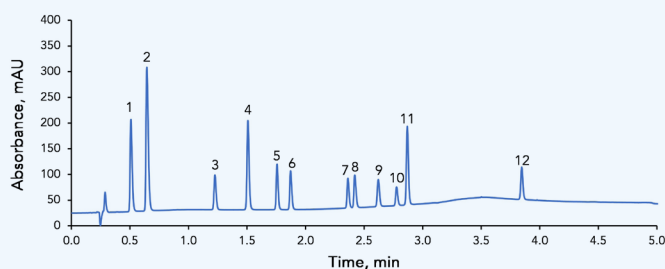
1. Cohumulone
2. Humulone
3. Adhumulone
4. Colupulone
5. Lupulone
6. Adlupulone

TEST CONDITIONS

Column: HALO 90 Å Biphenyl, 5 μm , 4.6 x 150 mm
 Mobile Phase A: water/0.1% formic acid
 Mobile Phase B: ACN/0.1% formic acid
 Gradient: Hold at 60% B until 3 min; 60-80% B from 3-6 min
 Flow Rate: 2.0 mL/min
 Temperature: 30 °C
 Injection Volume: 5 μL
 Instrument: Shimadzu Nexera X2
 Detection: 270 nm, PDA

RAPID, HIGH RESOLUTION SEPARATION OF BETA BLOCKERS

A mixture of twelve beta blockers is separated on a HALO[®] 2 μm Biphenyl column with excellent speed and resolution.

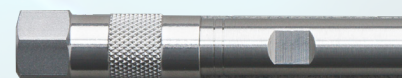


PEAK IDENTITIES

1. Atenolol
2. Sotalol
3. Nadolol
4. Pindolol
5. Acebutolol
6. Metoprolol
7. Bisoprolol
8. Oxprenolol
9. Labetalol
10. Alprenolol
11. Propranolol
12. Carvedilol

TEST CONDITIONS

Column: HALO 90 Å Biphenyl, 2 μm , 2.1 x 50 mm
 Mobile Phase A: water/0.1% formic acid
 Mobile Phase B: ACN/0.1% formic acid
 Gradient: 10-50% B in 5 min
 Flow Rate: 0.5 mL/min
 Temperature: 35 °C
 Injection Volume: 1 μL
 Instrument: Shimadzu Nexera X2
 Detection: 220 nm, PDA



SPECIFICATIONS

Ligand: Dimethylbiphenyl
 Particle Size: 2, 2.7, 5 μm
 Pore Size: 90 Å

USP Designation: L11
 Carbon Load: 6.7, 7.0, 5.5 %
 Surface Area: 120, 135, 90 m^2/g

Endcapped: Yes
 Low pH Limit /Max T: 2/60°C
 High pH Limit/Max T: 9/40°C

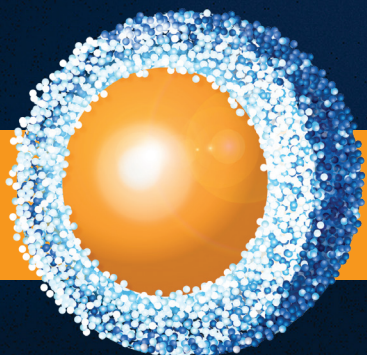
PART NUMBERS

ANALYTICAL COLUMNS				
ID	Length	2 μm	2.7 μm	5 μm
2.1 mm	20 mm	91812-211	92812-211	95812-211
2.1 mm	30 mm	91812-311	92812-311	95812-311
2.1 mm	50 mm	91812-411	92812-411	95812-411
2.1 mm	75 mm	91812-511	92812-511	95812-511
2.1 mm	100 mm	91812-611	92812-611	95812-611
2.1 mm	150 mm	91812-711	92812-711	95812-711
2.1 mm	250 mm	91812-911	92812-911	95812-911
3.0 mm	20 mm	91813-211	92813-211	95813-211
3.0 mm	30 mm	91813-311	92813-311	95813-311
3.0 mm	50 mm	91813-411	92813-411	95813-411
3.0 mm	75 mm	91813-511	92813-511	95813-511
3.0 mm	100 mm	91813-611	92813-611	95813-611
3.0 mm	150 mm	91813-711	92813-711	95813-711
3.0 mm	250 mm	91813-911	92813-911	95813-911
4.6 mm	20 mm		92814-211	95814-211
4.6 mm	30 mm		92814-311	95814-311
4.6 mm	50 mm		92814-411	95814-411
4.6 mm	75 mm		92814-511	95814-511
4.6 mm	100 mm		92814-611	95814-611
4.6 mm	150 mm		92814-711	95814-711
4.6 mm	250 mm		92814-911	95814-911
10.0 mm	50 mm		92810-411	95810-411
10.0 mm	75 mm		92810-511	95810-511
10.0 mm	100 mm		92810-611	95810-611
10.0 mm	150 mm		92810-711	95810-711

CAPILLARY COLUMNS			
ID	Length	2.7 μm	5 μm
0.075 mm	50 mm	98219-411	98519-411
0.075 mm	100 mm	98219-611	98519-611
0.075 mm	150 mm	98219-711	98519-711
0.1 mm	50 mm	98218-411	98518-411
0.1 mm	100 mm	98218-611	98518-611
0.1 mm	150 mm	98218-711	98518-711
0.2 mm	50 mm	98217-411	98517-411
0.2 mm	100 mm	98217-611	98517-611
0.2 mm	150 mm	98217-711	98517-711
0.3 mm	50 mm	98216-411	98516-411
0.3 mm	100 mm	98216-611	98516-611
0.3 mm	150 mm	98216-711	98516-711
0.5 mm	50 mm	98215-411	98515-411
0.5 mm	100 mm	98215-611	98515-611
0.5 mm	150 mm	98215-711	98515-711
1.0 mm	30 mm	92811-311	95811-311
1.0 mm	50 mm	92811-411	95811-411
1.0 mm	75 mm	92811-511	95811-511
1.0 mm	100 mm	92811-611	95811-611
1.0 mm	150 mm	92811-711	95811-711
GUARD COLUMNS (3 PK)			
Dimensions: ID x Length (in mm)	2 μm	2.7 μm	5 μm
2.1 x 5	91812-111	92812-111	95812-111
3.0 x 5	91813-111	92813-111	95813-111
4.6 x 5		92814-111	95814-111
Guard Column Holder		92814-111	

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