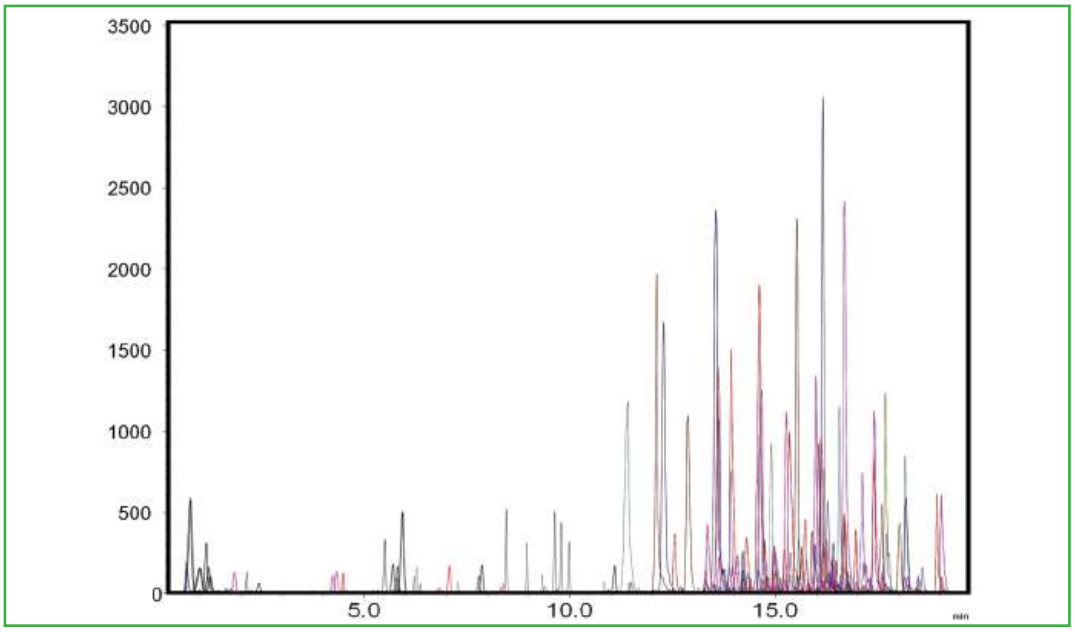
HALO®

ENVIRONMENTAL

LC-MS Analysis of Pesticides and Environmental Contaminants Spiked in Eggs using HALO® Biphenyl

282-P



PEAK IDENTITIES:

TEST CONDITIONS:

Analytical Column: HALO 90 Å Biphenyl, 2.7 µm, 2.1 x 100 mm
Part Number: 92812-611
Mobile Phase A: Water, 5 mM Ammonium Formate, 0.1 % Formic Acid
Mobile Phase B: ACN, 0.1 % Formic Acid
Flow Rate: 0.3 mL/min
Pressure: 144 bar
Temperature: 30 °C
Injection Volume: 1.0 µL
Sample Solvent: 50/50/ ACN/H2O
Detection: +ESI MS/MS
LC System: Shimadzu Nexera X2
ESI LCMS system: Shimadzu LCMS-8040

Gradient:

Time	%B
0.0	5
20.0	100
22.0	100
22.10	5
25.0	End

MS Source Conditions:
ESI +
Spray Voltage: 2.0 kV
Nebulizing gas: 2 L/min
Drying gas: 15 L/min
DL temp: 250 °C
Heat Block: 400 °C

Many challenges exist in environmental and food safety analysis, but possibly the most difficult one is presented by emerging contaminants, and as further research is carried out, the toxicity of these compounds will be further defined. Pesticides are examples of compounds that are commonly found in the environment and food supply, with increasing frequency. Although subjected to regulation, maximum allowable limits are decreasing.

It is critical in an evolving situation such as food safety analysis, to not only meet the demands and regulations of today, but also be able to address the future regulations that will be imposed. Here we present the HALO® Biphenyl for the separation and identification of a mixture of 161 pesticides and environmental contaminants spiked into egg samples at a concentration on 0.045ng/mL, in under 20 minutes. The high-speed separation is easily accomplished and can definitely find application in high throughput environments.

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ID#	Name	m/z	Ret. Time
1	MercaptoMethylimidazole	114.8800>57.1000	0.449
2	Dimetridazole hydroxy	158.0000>140.1000	0.544
3	Diuron	232.9400>72.0000	0.557
4	Daminozide	161.0100>143.0000	0.669
5	Ketoprofen	255.1000>77.0000	0.729
6	Propanil	218.0000>162.1000	0.921
7	NalidixicAcid	233.1000>215.1000	1.095
8	Methamidophos	141.9000>94.0000	1.739
9	Methomyl	163.0200>106.0000	2.163
10	NiflumicAcid	283.0000>265.0000	2.441
11	Acephate	184.0000>143.1000	2.515
12	Aldicarb sulfoxide	207.0200>132.1000	4.269
13	Dinotefuran	203.0600>129.1000	4.376
14	Omethoate	214.0000>182.9000	4.552
15	Quinclorac	241.9000>224.0000	5.051
16	Flonicamid	230.0200>203.1000	5.758
17	Aldicarb sulfone	223.0200>86.1000	5.812
18	Salbutamol	240.2000>148.1000	5.842
19	Ipronidazole hydroxy	186.0000>168.0000	6.089
20	Pymetrozine	217.9900>104.9000	6.104
21	Carbendazim	192.0000>160.1000	6.219
22	Flunixin	297.0000>279.0000	6.641
23	Nitenpyran	271.0000>126.0000	6.969
24	OxamylNH4	237.0100>72.0000	7.051
25	OxydemetonMethyl	246.9300>169.1000	7.348
26	Clothianidin	250.0000>169.2000	7.705
27	AldicarbNH4	208.1000>116.1000	7.821
28	Ciprofloxacin	332.1000>314.1000	8.318
29	Dicrotophos	238.0000>112.0000	8.371
30	Thiamethoxam	292.0100>211.1000	8.426
31	Dimethoate	229.9500>199.1000	8.843
32	Cymoxanil	199.0000>128.1000	9.295
33	SulfoxaflorNH4	294.9700>174.1000	9.396
34	Atrazine	216.0300>174.1000	9.398
35	MeclofenamicAcid	296.0000>278.0000	9.681
36	Imidacloprid	255.9400>209.0000	9.987
37	Xylazine	221.0000>164.0000	10.047
38	Mercaptobenzimidazole	150.9600>93.0000	10.399
39	Dichlorvos	220.9000>109.0000	10.762
40	Acetamiprid	223.0100>126.0000	10.948
41	Cyprodinil	226.0500>93.1000	11.113
42	Tebuthiuron	229.0000>172.3000	11.389
43	Morantel	221.1000>123.0000	11.395
44	Imazethapyr	290.0200>245.1000	11.445
45	Trimethoprim	291.1000>230.0000	11.467
46	Diflufenzopyr	335.0000>206.2000	11.574
47	Metalaxyl	280.0100>220.2000	11.796
48	Carbofuran	222.0000>123.0000	12.106
49	Thiacloprid	252.9800>126.2000	12.282
50	Imazalil	296.9700>159.1000	12.551
51	AlbendazoleSulfone	298.0000>159.0000	12.561
52	Fenbufen	255.1000>181.1000	12.675
53	Flunixin-d3	300.0000>282.0000	12.785
54	ThiophanateMethyl	343.0200>151.0000	12.871
55	Clencyclohexerol	319.1000>301.0000	12.986
56	Propyphenazone	231.1000>189.1000	13.135
57	Linuron	248.9000>160.1000	13.304
58	Flubendazole2amino	256.0000>123.0000	13.347
59	Fenobucarb	208.0500>95.0000	13.355
60	Fosthiazate	283.9800>228.0000	13.513
61	Dodemorph	282.2000>116.1000	13.556
62	Azamethiphos	324.9000>183.0000	13.613
63	Azamethiphos	324.9000>183.0000	13.619
64	Ethiprole	398.9000>352.9000	13.626
65	EthiproleNH4	413.9000>351.0000	13.641
66	Pronamide	256.0000>190.0000	13.716
67	Pyrimethanil	200.1000>107.2000	13.739
68	Paclobutrazol	294.0300>70.0000	13.914
69	Norflurazon	303.9000>284.0000	13.936
70	Cyantraniliprole	475.1000>286.0000	13.956
71	Triadimenol	296.0000>70.1000	14.074
72	Methiocarb	226.0100>169.0000	14.209
73	Etoxazole	360.1700>141.0000	14.222
74	Chlorsulfuron	357.9000>167.1000	14.234
75	Triasulfuron	401.9800>167.0000	14.299
76	FenthionSulfone	311.0000>125.0000	14.328
77	Mabuterol	311.1000>237.0000	14.576
78	Fluxapyroxad	382.0000>362.1000	14.591
79	Iprovalicarb	321.1000>119.0000	14.611
80	Fluopyram	396.9800>208.0000	14.619
81	Flutolanil	324.0000>242.1000	14.652
82	Chlorantraniliprole	484.0000>452.9000	14.715
83	Fenhexamid	302.0600>96.9000	14.732
84	Myclobuthanil	289.0100>70.0000	14.903
85	Penthiopyrad	360.0400>276.1000	14.961
86	Tetraconazole	372.0000>159.1000	14.987
87	Fenamidone	312.0000>236.2000	15.003
88	Saflufenacil	501.0000>349.0000	15.014
89	Boscalid	343.0000>307.1000	15.092
90	Clethodim	360.0000>164.0000	15.123
91	Ethoprophos	243.0600>172.9000	15.222
92	Methidathion	302.8800>144.9000	15.233
93	Methoxyfenozide	369.1000>149.1000	15.266
94	Fenarimol	330.9000>268.1000	15.309
95	Hexaconazole	315.9900>69.9000	15.353
96	Thiodicarb	354.9600>88.0000	15.361
97	Tebuconazole	308.0200>70.0000	15.375
98	Fenoterol	304.1000>107.2000	15.491
99	Fenamiphos	304.0000>217.1000	15.524
100	Diflubenzuron	310.9600>158.0000	15.536
101	Penconazole	285.9500>70.0000	15.568
102	Flufenacet	363.9500>194.1000	15.582
103	Bifenazate	301.1000>198.1000	15.726
104	Penoxsulam	484.0000>195.2000	15.758
105	Benzovindiflupyr	398.0500>342.0000	15.897
106	Flusilazole	315.9900>247.0000	15.965
107	Epoxiconazole	330.0000>121.1000	15.991
108	Dimethomorph	388.0600>301.0000	16.048
109	Phosmet	318.0100>160.0000	16.114
110	Fenoxycarb	302.0000>116.0000	16.145
111	Triazophos	313.9200>162.0000	16.152
112	Spirotetramat	374.1200>302.1000	16.161
113	Diazinon	305.0000>169.1000	16.176
114	Spiromesifen	388.1100>273.2000	16.237
115	Fenbuconazole	337.0200>125.0000	16.238
116	Bitertanol	338.1100>269.1000	16.367
117	Cyazofamid	324.9000>107.9000	16.372
118	Tolyfluanid	347.0000>137.0000	16.377
119	Novaluron	493.0100>158.2000	16.396
120	Tetrachlorvinphos	364.9000>127.0000	16.414
121	Triflumizole	346.0500>277.9000	16.473
122	Chlorfenvinphos	358.9000>155.1000	16.476
123	Isofenphos	346.0100>245.1000	16.531
124	Phorate	260.9300>74.9000	16.554
125	Picoxystrobin	368.0000>145.1000	16.556
126	Propiconazole	342.0700>159.1000	16.564
127	PyraflufenEthyl	412.9000>339.0000	16.633
128	PirimiphosMethyl	305.9000>164.2000	16.686
129	Azoxystrobin	404.0400>372.1000	16.686
130	ChlorimuronEthyl	414.9680>186.0000	16.699
131	Disulfoton	274.9500>88.9000	16.834
132	Fenthion	279.0000>247.0000	16.838
133	Tebufenpyrad	334.0900>145.1000	16.954
134	Prallethrin	301.0500>123.1000	16.975
135	Spinetoram	748.4000>142.2000	17.118
136	Prochloraz	375.9000>308.2000	17.16
137	Profenofos	372.9000>302.8000	17.162
138	ChlorpyriphosMethyl	321.9000>125.0000	17.206
139	Clofentezine	303.0000>138.0000	17.322
140	Fluoxastrobin	459.0000>427.0000	17.396
141	Trifloxystrobin	409.1000>186.1000	17.411
142	MalichiteGreen leuco	331.2000>239.1000	17.577
143	Difenoconazole	406.0000>250.9000	17.584
144	Phosalone	367.9000>182.1000	17.631
145	PiperonylButoxide	356.1100>177.2000	17.687
146	Pyraclostrobin	388.1000>194.2000	17.699
147	FenoxapropEthyl	361.9800>288.0000	17.716
148	Indoxacarb	527.9000>248.8000	17.751
149	QuizalofopEthyl	373.0000>299.1000	18.024
150	CrystalViolet leuco	374.2000>238.2000	18.168
151	Pyriproxyfen	322.0600>95.9000	18.172
152	Pyrazophos	374.0100>222.0000	18.186
153	Coumaphos	362.8000>227.0000	18.217
154	PropargiteNH4	368.1000>231.2000	18.245
155	Hexythiazox	353.0100>228.1000	18.431
156	Spirodiclofen	411.1000>313.0000	18.463
157	Acequinocyl	357.2000>329.3000	18.521
158	FenpropathrinNH4	367.1100>125.0000	18.586
159	Fenpyroximate	422.2000>366.1000	18.934
160	Phenothrin	351.0800>183.0000	19.048
161	Pyridaben	365.0500>309.0000	19.054

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