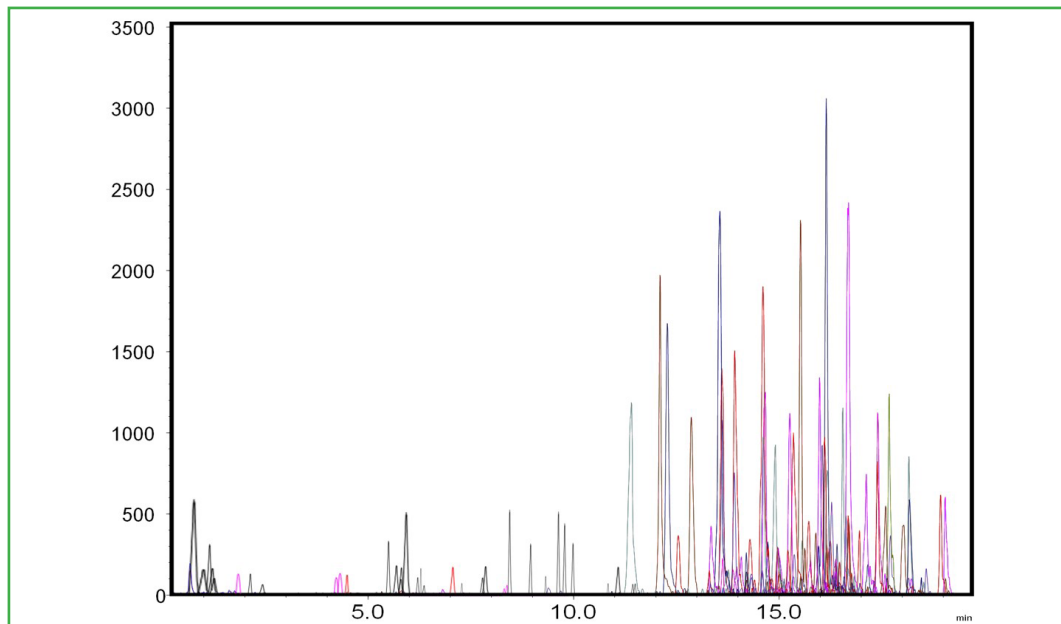




## LC-MS Analysis of Pesticides and Environmental Contaminants Spiked in Eggs using HALO® Biphenyl

282-P



PEAK IDENTITIES:

### TEST CONDITIONS:

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

**Sample Solvent:** 50/50/ ACN/H<sub>2</sub>O

**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.





ID#	Name	m/z	Ret. Time	ID#	Name	m/z	Ret. Time
1	MercaptoMethylimidazole	114.8800>57.1000	0.449	82	Chlorantraniliprole	484.0000>452.9000	14.715
2	Dimetridazole hydroxy	158.0000>140.1000	0.544	83	Fenhexamid	302.0600>96.9000	14.732
3	Diuron	232.9400>72.0000	0.557	84	Myclobuthanil	289.0100>70.0000	14.903
4	Daminozide	161.0100>143.0000	0.669	85	Penthiopyrad	360.0400>276.1000	14.961
5	Ketoprofen	255.1000>77.0000	0.729	86	Tetraconazole	372.0000>159.1000	14.987
6	Propanil	218.0000>162.1000	0.921	87	Fenamidone	312.0000>236.2000	15.003
7	NalidixicAcid	233.1000>215.1000	1.095	88	Saflufenacil	501.0000>349.0000	15.014
8	Methamidophos	141.9000>94.0000	1.739	89	Boscalid	343.0000>307.1000	15.092
9	Methomyl	163.0200>106.0000	2.163	90	Clethodim	360.0000>164.0000	15.123
10	NiflumicAcid	283.0000>265.0000	2.441	91	Ethoprophos	243.0600>172.9000	15.222
11	Acephate	184.0000>143.1000	2.515	92	Methidathion	302.8800>144.9000	15.233
12	Aldicarb sulfoxide	207.0200>132.1000	4.269	93	Methoxyfenozide	369.1000>149.1000	15.266
13	Dinotefuran	203.0600>129.1000	4.376	94	Fenarimol	330.9000>268.1000	15.309
14	Omethoate	214.0000>182.9000	4.552	95	Hexaconazole	315.9900>69.9000	15.353
15	Quinclorac	241.9000>224.0000	5.051	96	Thiodicarb	354.9600>88.0000	15.361
16	Flonicamid	230.0200>203.1000	5.758	97	Tebuconazole	308.0200>70.0000	15.375
17	Aldicarb sulfone	223.0200>86.1000	5.812	98	Fenoterol	304.1000>107.2000	15.491
18	Salbutamol	240.2000>148.1000	5.842	99	Fenamiphos	304.0000>217.1000	15.524
19	Ipronidazole hydroxy	186.0000>168.0000	6.089	100	Diffubenzuron	310.9600>158.0000	15.536
20	Pymetrozine	217.9900>104.9000	6.104	101	Penconazole	285.9500>70.0000	15.568
21	Carbendazim	192.0000>160.1000	6.219	102	Flufenacet	363.9500>194.1000	15.582
22	Flunixin	297.0000>279.0000	6.641	103	Bifenazate	301.1000>198.1000	15.726
23	Nitenpyran	271.0000>126.0000	6.969	104	Penoxsulam	484.0000>219.2000	15.758
24	OxamylNH4	237.0100>72.0000	7.051	105	Benzovindiflupyr	398.0500>342.0000	15.897
25	OxydemetonMethyl	246.9300>169.1000	7.348	106	Flusilazole	315.9900>277.0000	15.965
26	Clothianidin	250.0000>169.2000	7.705	107	Epoxiconazole	330.0000>121.1000	15.991
27	AldicarbNH4	208.1000>116.1000	7.821	108	Dimethomorph	388.0600>301.0000	16.048
28	Ciprofloxacin	332.1000>314.1000	8.318	109	Phosmet	318.0100>160.0000	16.114
29	Diclotophos	238.0000>112.0000	8.371	110	Fenoxycarb	302.0000>116.0000	16.145
30	Thiamethoxam	292.0100>211.1000	8.426	111	Triazophos	313.9200>162.0000	16.152
31	Dimethoate	229.9500>199.1000	8.843	112	Spirotetramat	374.1200>302.1000	16.161
32	Cymoxanil	199.0000>128.1000	9.295	113	Diazinon	305.0000>169.1000	16.176
33	SulfosfaxlorNH4	294.9700>174.1000	9.396	114	Spiromesifen	388.1100>273.2000	16.237
34	Atrazine	216.0300>174.1000	9.398	115	Fenbuconazole	337.0200>125.0000	16.238
35	MeclofenamicAcid	296.0000>278.0000	9.681	116	Bitertanol	338.1100>269.1000	16.367
36	Imidacloprid	255.9400>209.0000	9.987	117	Cyazofamid	324.9000>107.9000	16.372
37	Xylazine	221.0000>164.0000	10.047	118	Tolyfluamid	347.0000>137.0000	16.377
38	Mercaptobenzimidazole	150.9600>93.0000	10.399	119	Novaluron	493.0100>158.2000	16.396
39	Dichlorvos	220.9000>109.0000	10.762	120	Tetrachlorvinphos	364.9000>127.0000	16.414
40	Acetamiprid	223.0100>126.0000	10.948	121	Triflumizole	346.0500>277.9000	16.473
41	Cyprodinil	226.0500>93.1000	11.113	122	Chlorfenvinphos	358.9000>155.1000	16.476
42	Tebuthiuron	229.0000>172.3000	11.389	123	Isofenphos	346.0100>245.1000	16.531
43	Morantel	221.1000>123.0000	11.395	124	Phorate	260.9300>74.9000	16.554
44	Imazethapyr	290.0200>245.1000	11.445	125	Picoxystrobin	368.0000>145.1000	16.556
45	Trimethoprim	291.1000>230.0000	11.467	126	Propiconazole	342.0700>159.1000	16.564
46	Diffufenzopyr	335.0000>206.2000	11.574	127	PyraflufenEthyl	412.9000>339.0000	16.633
47	Metalaxyl	280.0100>220.2000	11.796	128	PirimiphosMethyl	305.9000>164.2000	16.686
48	Carbofuran	222.0000>123.0000	12.106	129	Azoxystrobin	404.0400>372.1000	16.686
49	Thiacloprid	252.9800>126.2000	12.282	130	ChlorimuronEthyl	414.9680>186.0000	16.699
50	Imazalil	296.9700>159.1000	12.551	131	Disulfoton	274.9500>88.9000	16.834
51	AlbendazoleSulfone	298.0000>159.0000	12.561	132	Fenthion	279.0000>247.0000	16.838
52	Fenbufen	255.1000>181.1000	12.675	133	Tebufenpyrad	334.0900>145.1000	16.954
53	Flunixin-d3	300.0000>282.0000	12.785	134	Prallethrin	301.0500>123.1000	16.975
54	ThiophanateMethyl	343.0200>151.0000	12.871	135	Spinetoram	748.4000>142.2000	17.118
55	Clencyclohexerol	319.1000>301.0000	12.986	136	Prochloraz	375.9000>308.2000	17.16
56	Propyphenazone	231.1000>189.1000	13.135	137	Profenofos	372.9000>302.8000	17.162
57	Linuron	248.9000>160.1000	13.304	138	ChlorpyrifosMethyl	321.9000>125.0000	17.206
58	FlubendazoleZamino	256.0000>123.0000	13.347	139	Clofentezine	303.0000>138.0000	17.322
59	Fenobucarb	208.0500>95.0000	13.355	140	Fluoxastrobin	459.0000>427.0000	17.396
60	Fosthiazate	283.9800>228.0000	13.513	141	Trifloxystrobin	409.1000>186.1000	17.411
61	Dodemorph	282.2000>116.1000	13.556	142	MalichiteGreen leuco	331.2000>239.1000	17.577
62	Azamethiphos	324.9000>183.0000	13.613	143	Difenoconazole	406.0000>250.9000	17.584
63	Azamethiphos	324.9000>183.0000	13.619	144	Phosalone	367.9000>182.1000	17.631
64	Ethiprole	398.9000>352.9000	13.626	145	PiperonylButoxide	356.1100>177.2000	17.687
65	EthiproleNH4	413.9000>351.0000	13.641	146	Pyraclostrobin	388.1000>194.2000	17.699
66	Pronamide	256.0000>190.0000	13.716	147	FenoxapropEthyl	361.9800>288.0000	17.716
67	Pyrimethanil	200.1000>107.2000	13.739	148	Indoxacarb	527.9000>248.8000	17.751
68	Paclbutrazol	294.0300>70.0000	13.914	149	QuizalofopEthyl	373.0000>299.1000	18.024
69	Norflurazon	303.9000>284.0000	13.936	150	CrystalViolet leuco	374.2000>238.2000	18.168
70	Cyantraniliprole	475.1000>286.0000	13.956	151	Pyriproxyfen	322.0600>95.9000	18.172
71	Triadimenol	296.0000>70.1000	14.074	152	Pyrazophos	374.0100>222.0000	18.186
72	Methiocarb	226.0100>169.0000	14.209	153	Coumaphos	362.8000>227.0000	18.217
73	Etoxazole	360.1700>141.0000	14.222	154	PropargiteNH4	368.1000>231.2000	18.245
74	Chlorsulfuron	357.9000>167.1000	14.234	155	Hexythiazox	353.0100>228.1000	18.431
75	Triasulfuron	401.9800>167.0000	14.299	156	Spirodiclofen	411.1000>313.0000	18.463
76	FenthionSulfone	311.0000>125.0000	14.328	157	Acequinocyl	357.2000>329.3000	18.521
77	Mabuterol	311.1000>237.0000	14.576	158	FenpropathrinNH4	367.1100>125.0000	18.586
78	Fluxapyroxad	382.0000>362.1000	14.591	159	Fenpyroximate	422.2000>366.1000	18.934
79	Iprovalicarb	321.1000>119.0000	14.611	160	Phenothrin	351.0800>183.0000	19.048
80	Fluopyram	396.9800>208.0000	14.619				
81	Flutolanil	324.0000>242.1000	14.652	161	Pyridaben	365.0500>309.0000	19.054

