



Featured Application: *Multiresidue Pesticide Mix Extracted from Brown Rice Flour
Using QuEChERS Extraction and Cleanup*

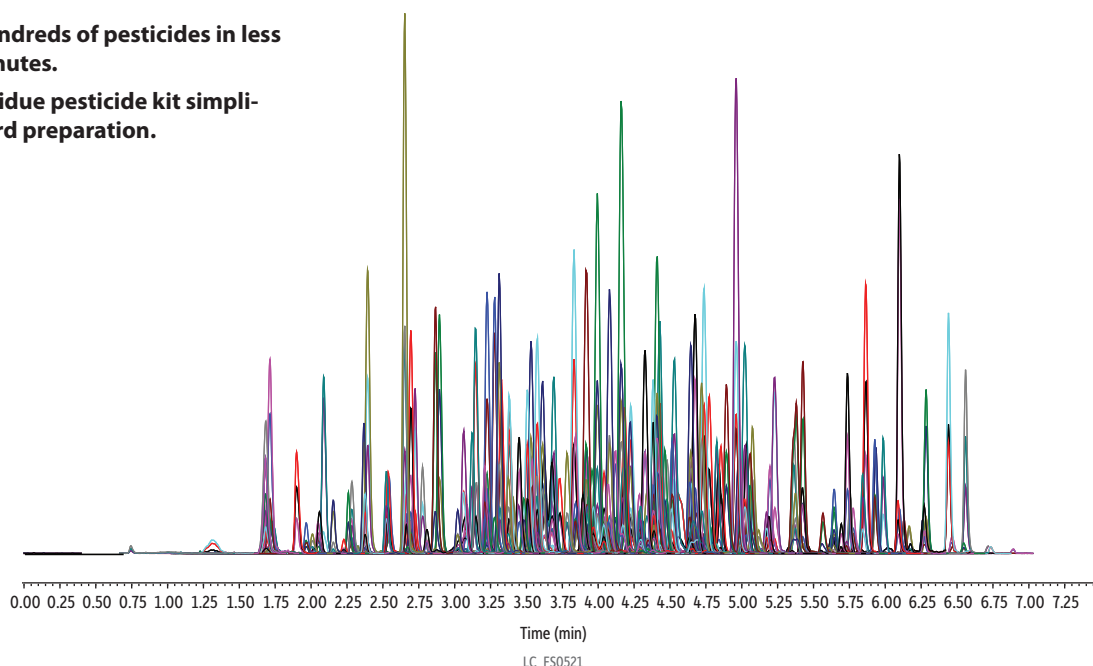
7.5-Min Screening Analysis of Multiresidue Pesticides in Brown Rice Flour

- 7.5-min analysis with complete analytical cycle time of less than 10 min.
- Over 90% of the 200+ residues analyzed exhibit recoveries between 70-120%.
- Compatible with both traditional HPLC and modern UHPLC instruments.

Analysis of multiresidue pesticides is no easy task, and it's made even more difficult by complex sample matrices and the sophistication of the LC-MS/MS instrumentation commonly used for analysis. An LC-MS/MS can provide remarkable sensitivity, even allowing a degree of chromatographic coelutions to exist and still quantitatively monitor analytes of interest. However, too many coelutions can overwhelm the mass spectrometer, so a good chromatographic method is still essential. The optimized chromatographic method described here allows the analysis of hundreds of compounds in as little as 7.5 minutes with a total cycle time under 10 minutes, ensuring fast, accurate sample screening and increased lab productivity.

As detailed below, a sample of brown rice flour was fortified with all of the components included in the Restek LC multiresidue pesticide kit, extracted with Q-sep QuEChERS extraction salts, cleaned up using dSPE, and analyzed using a 2.7 μ m Raptor ARC-18 column. The inherent efficiency of a 2.7 μ m superficially porous particle column produces narrow peaks, which permits more compounds to be fit into a given unit of time. The selectivity of the Raptor ARC-18 stationary phase ensures that compounds elute throughout the entire length of the analysis, which avoids crowding compounds in time and potentially taxing the mass spectrometer's ability to monitor all the relevant ions effectively. Note that it is important to keep internal system volume down to a minimum, so selecting narrow-bore LC tubing and avoiding excess lengths of tubing will help produce the narrowest peaks and achieve the quickest, most efficient chromatography. This analysis of multiresidue pesticides in brown rice flour uses straightforward mobile phases that are mass spec friendly and a flow rate that keeps the back pressure within the operating range of conventional HPLC instruments. These advantages make it possible to analyze over 200 pesticides, surrogates, and internal standards—even in such a challenging matrix—in a matter of minutes.

- Analyze hundreds of pesticides in less than 10 minutes.
- LC multiresidue pesticide kit simplifies standard preparation.



Column Raptor ARC-18 (cat.# 9314A12)
Dimensions: 100 mm x 2.1 mm ID
Particle Size: 2.7 µm
Pore Size: 90 Å
Guard Column: Raptor ARC-18 EXP guard column cartridge 5 mm, 2.1 mm ID, 2.7 µm (cat.# 9314A0252)
Temp.: 50 °C
Sample LC multiresidue pesticide kit (cat.# 31971)
Diluent: Water:acetonitrile 9:1
Conc.: 1 ng/mL see notes for details
Inj. Vol.: 5 µL
Mobile Phase
A: 0.2% Formic acid, 2 mM ammonium formate in water
B: 0.2% Formic acid, 2 mM ammonium formate in methanol

Time (min)	Flow (mL/min)	%A	%B
0.00	0.4	95	5
2.00	0.4	40	60
4.00	0.4	25	75
6.00	0.4	0	100
7.50	0.4	0	100
7.51	0.4	95	5
9.50	0.4	95	5

Detector MS/MS
Ion Mode: ESI+/ESI-
Mode: Scheduled MRM
Instrument UHPLC

Notes Although the ten LC multiresidue pesticides kit mixes are formulated to ensure maximum long-term stability and reliability as packaged, stability may become an issue when a large number of compounds with different chemical functionalities are combined together into a single mix. This should be taken into consideration for quantitative analysis.

Sample Preparation:
 Brown rice flour (10 g), purchased from a local market, was mixed with 10 mL water. After mixing for 10 min, the brown rice flour was fortified at 10 ng/g with all residues from the LC multiresidue pesticide kit (cat.# 31971), which had been previously combined into a single mixture that day. The fortified brown rice flour suspension was then mixed for 30 min to ensure uniform dispersion of the added pesticide residues in the brown rice flour suspension. Extraction was performed using 10 mL of acetonitrile and original unbuffered QuEChERS salts (cat.# 25848). After centrifugation, 1 mL supernatant was added to a 2 mL dSPE vial containing magnesium sulfate, PSA, and C18 (cat.# 26125) for cleanup. After centrifugation, 100 µL of the 10 ng/mL extract was diluted with 900 µL water and injected onto the UHPLC.

(cont.):

	t _R	Precursor	Product	Product		t _R	Precursor	Product	Product		t _R	Precursor	Product	Product
Peaks	(min)	Ion	Ion 1	Ion 2	Peaks	(min)	Ion	Ion 1	Ion 2	Peaks	(min)	Ion	Ion 1	Ion 2
1. Cyromazine	0.747	167.1	68.1	43.1	71. Isoprocarb	3.537	194.1	95.1	137.1	141. Dimoxystrobin	4.738	327.1	205.1	116.1
2. Methamidophos	1.318	142.0	94.0	125.1	72. Fenpropimorph	3.561	304.2	147.1	117.0	142. Bromuconazole isomer 2	4.740	378.0	159.0	159.0
3. Formetanate	1.681	222.1	165.0	46.1	73. Atrazine-d5 (SS)	3.575	221.2	179.2	101.3	143. Flubendiamide	4.745	700.0	408.0	274.0
4. Carbofuran	1.682	222.2	165.0	123.1	74. Isocarbofos	3.606	291.1	231.1	121.1	144. Diclobutrazol	4.764	328.0	70.1	159.0
5. Methabenzthiazuron	1.686	222.0	165.0	150.0	75. Isoproturon	3.612	207.1	72.1	46.1	145. Carfentrazone ethyl	4.773	429.1	412.1	346.1
6. Acephate	1.690	184.0	143.0	49.0	76. Desmedipham	3.620	318.0	154.1	301.0	146. Kresoxim-methyl	4.795	314.0	267.1	116.0
7. Pymetrozine	1.708	218.1	105.0	78.0	77. Phenmedipham	3.623	318.1	108.1	93.1	147. Tebuconazole	4.827	308.0	70.1	124.9
8. Aminocarb	1.716	209.1	137.1	152.1	78. Spiroxamine	3.626	298.2	144.2	58.2	148. Spinosad A	4.840	732.5	142.1	98.1
9. Propamocarb	1.735	189.1	102.0	144.1	79. Pyrimethanil	3.659	200.0	107.0	82.0	149. Penconazole	4.853	284.1	70.1	159.0
10. Omethoate	1.905	214.0	125.0	183.0	80. Metalaxyl	3.691	280.1	220.1	192.1	150. Prothioconazole	4.857	344.0	189.0	154.0
11. Dinotefuran	1.972	203.1	129.1	87.1	81. Chlorantraniliprole	3.730	484.0	452.8	285.8	151. Zoxamide	4.893	336.1	187.0	159.0
12. Aldicarb sulfoxide	2.010	207.1	89.0	132.1	82. Cycluron	3.785	199.1	89.1	46.0	152. Famoxadone	4.933	392.2	331.1	238.0
13. Butoxycarboxim	2.022	223.0	106.0	166.0	83. Prometryn	3.830	242.1	158.0	200.2	153. Diazinon-diethyl-d10 (IS)	4.961	315.2	170.2	154.3
14. Nitenpyram	2.049	271.0	225.0	56.0	84. Linuron-d6 (SS)	3.843	255.1	160.1	185.2	154. Hydramethylnon	4.979	495.2	323.2	45.2
15. Aldicarb sulfone	2.062	240.2	148.0	86.0	85. Linuron	3.854	249.0	160.0	182.0	155. Triflumuron	4.986	359.1	156.0	111.0
16. Carbazodim	2.090	192.0	160.0	131.9	86. Thiofanox	3.876	242.1	57.2	184.0	156. Prochloraz	4.986	376.0	308.0	70.1
17. Oxamyl	2.154	237.1	72.0	90.0	87. Fenobucarb	3.894	208.0	95.1	152.1	157. Hexaconazole	4.993	314.1	70.0	158.8
18. Flonicamid	2.234	230.1	203.0	148.0	88. Azoxystrobin	3.915	404.2	329.0	344.0	158. Benalaxyl	5.021	326.2	148.0	208.1
19. Methomyl	2.259	163.1	88.0	106.1	89. Diethofencarb	3.924	268.1	226.1	124.0	159. Metconazole	5.033	320.1	70.1	125.0
20. Thiabendazole	2.284	201.8	92.2	104.0	90. Ethofumesate	3.925	304.1	121.1	241.0	160. Propiconazole	5.054	342.0	159.0	69.0
21. Thiamethoxam	2.289	292.1	211.1	181.1	91. Ethiprole	3.932	397.0	350.9	255.0	161. Pyraclostrobin	5.076	388.0	194.0	163.1
22. Flubendazole	2.368	185.0	157.1	103.0	92. Fludioxonil*	3.935	247.1	180.1	126.1	162. Clofentezine	5.080	303.0	138.0	102.0
23. Monocrotophos	2.375	224.1	127.0	193.1	93. Methiocarb	3.958	226.1	169.1	121.1	163. Bitteranol	5.120	338.2	269.2	70.1
24. Mexacarbate	2.393	223.2	166.1	151.1	94. Siduron	3.967	233.3	94.0	137.1	164. Spinosad D	5.142	746.5	142.0	98.0
25. Dioxacarb	2.397	224.1	167.0	77.1	95. Halofenozide	3.974	331.1	104.9	275.0	165. Benzoximate	5.171	364.0	199.1	105.0
26. Dicrotophos	2.526	238.1	112.1	72.0	96. Fenamidone	3.993	312.0	92.1	236.1	166. Diniconazole	5.184	326.1	70.0	158.9
27. Imidacloprid	2.536	256.1	175.0	209.0	97. Furalaxyl	3.995	302.1	242.1	95.0	167. Thiobencarb	5.197	258.0	125.0	89.1
28. Clothianidin	2.545	250.0	169.0	113.0	98. Acibenzolar-S-methyl	4.023	210.9	136.1	91.1	168. Pencycuron	5.229	329.1	125.0	89.0
29. Dimethoate-d6 (IS)	2.652	236.2	205.2	131.2	99. Nuairimol	4.030	315.1	252.0	207.0	169. Spinetoram	5.234	748.5	142.1	98.2
30. Fenuron	2.662	165.0	72.1	46.1	100. Dimethomorph	4.044	388.2	300.9	165.1	170. Hexaflumuron*	5.351	459.0	439.0	175.0
31. Trichlorfon	2.667	257.0	108.9	220.8	101. Boscalid	4.050	343.0	306.8	140.0	171. Triflumizole	5.366	346.1	278.0	73.1
32. Dimethoate	2.668	230.0	199.0	125.0	102. Mandipropamid	4.067	412.1	328.1	125.0	172. Indoxacarb	5.375	528.1	149.9	203.0
33. 3-Hydroxycarbofuran	2.679	238.1	181.0	163.0	103. Flutolanil	4.079	324.1	262.0	242.0	173. Difenoconazole	5.380	406.1	251.1	152.0
34. Vamidothion	2.695	288.0	146.0	118.0	104. Promecarb	4.104	208.1	109.0	151.0	174. Ipconazole	5.426	334.2	70.0	124.9
35. Mevinphos	2.715	225.1	127.0	127.0	105. Paclobutrazol	4.119	294.0	70.1	125.0	175. Trifloxystrobin	5.426	409.0	186.0	206.0
36. Acetamiprid	2.724	223.0	126.0	56.1	106. Triadimenol	4.119	296.1	70.1	43.1	176. Novaluron*	5.455	491.0	471.0	304.9
37. Propoxur	2.777	210.0	111.0	168.0	107. Mepronil	4.161	270.1	91.1	119.0	177. Emamectin-benzoate B1b	5.463	872.2	158.2	82.1
38. Ethirimol	2.780	210.2	140.2	98.2	108. Cyproconazole	4.175	292.2	70.1	125.0	178. Clethodim	5.565	360.1	164.1	268.1
39. Cymoxanil	2.805	199.1	128.2	111.2	109. Myclobutanil	4.195	289.2	70.1	125.1	179. Teflubenzuron	5.614	380.9	140.9	158.0
40. Thiacloprid	2.865	253.0	126.0	99.0	110. Chloroxuron	4.225	291.1	72.1	46.1	180. Alanycarb	5.636	400.1	91.0	238.0
41. Pirimicarb	2.896	239.2	72.0	182.1	111. Bupirimate	4.226	317.2	166.0	237.1	181. Buprofezin	5.642	306.2	106.1	86.0
42. Aldicarb	3.022	208.2	116.2	89.2	112. Methoxyfenozide	4.230	369.2	149.0	313.1	182. Emamectin-benzoate B1a	5.644	886.5	158.0	82.1
43. Tricyclazole	3.066	190.0	163.0	136.0	113. Triadimefon	4.287	294.0	69.0	197.0	183. Benfuracarb	5.695	411.2	194.9	251.9
44. Oxadixyl	3.076	279.1	219.1	132.1	114. Bifenazate	4.290	301.1	198.0	170.1	184. Fluzinam*	5.726	463.0	415.9	397.9
45. Carbetamide	3.085	237.1	192.0	118.1	115. Cyprodinil	4.313	226.1	93.0	77.0	185. Metaflumizone*	5.728	505.1	302.1	328.0
46. Simetryn	3.122	214.1	68.0	96.0	116. Mefenacet	4.325	299.1	148.1	120.1	186. Furathiocarb	5.735	383.1	195.0	252.1
47. Thiophanate-methyl	3.146	343.0	151.0	311.1	117. Mepanipyrim	4.334	224.1	77.1	106.1	187. Temephos	5.757	467.1	125.0	418.9
48. Thidiazuron	3.150	221.1	102.1	127.9	118. Fluquinconazole	4.346	376.0	348.9	307.0	188. Lufenuron	5.767	511.2	141.0	158.0
49. Bendiocarb	3.212	224.1	167.1	109.0	119. Fenhexamid	4.383	302.1	97.1	55.1	189. Tebufenpyrad	5.778	334.0	117.0	145.0
50. Imazalil	3.225	297.1	159.0	41.1	120. Fluxastrobin	4.385	459.2	427.0	188.1	190. Pyriproxyfen	5.843	322.0	96.0	227.1
51. Prometon	3.227	226.1	142.1	184.0	121. Tetraconazole	4.387	372.0	159.0	70.0	191. Piperonyl butoxide	5.864	356.2	177.0	119.1
52. Metribuzin	3.230	215.1	187.1	131.0	122. Bromuconazole isomer 1	4.392	376.0	159.0	159.0	192. Hexythiazox	5.924	353.2	228.0	168.1
53. Secbumeton	3.232	226.2	170.2	100.2	123. Butafenacil	4.411	492.1	330.9	179.9	193. Quinoxifen	5.935	308.1	197.0	162.0
54. Terbumeton	3.235	226.1	114.1	170.1	124. Iprovalicarb	4.412	321.2	119.0	91.1	194. Flufenoxuron	5.984	489.1	158.0	141.0
55. Sulfentrazone*	3.263	387.0	309.0	201.0	125. Flufenacet	4.427	364.1	152.0	194.1	195. Propargite	6.088	368.1	231.1	175.0
56. Pyracarbolid	3.279	218.1	125.1	97.0	126. Triticonazole	4.429	318.0	70.0	125.0	196. Etoxazole	6.099	360.2	141.0	57.1
57. Tebutiuron	3.310	229.1	172.1	116.0	127. Cyazofamid	4.441	325.1	108.0	44.0	197. Spiromesifen	6.129	371.3	273.2	255.2
58. Carbaryl	3.316	202.1	145.0	127.0	128. Diflubenzuron	4.464	311.0	158.0	141.0	198. Chlorfluazuron	6.165	539.8	382.9	158.0
59. Carboxin	3.326	236.1	143.0	87.1	129. Spirotetramat	4.478	374.1	330.1	302.0	199. Spirodiclofen	6.269	428.3	71.1	313.1
60. Monolinuron	3.373	215.1	126.0	148.0	130. Fenarimol	4.510	331.0	267.9	189.1	200. (E)-Fenpyroximate	6.283	422.1	366.1	138.1
61. Fluometuron	3.381	233.1	72.1	46.1	131. Fenbuconazole	4.516	337.0	125.0	70.1	201. Pyridaben	6.442	365.2	147.0	309.1
62. Diuron	3.382	233.1	72.1	46.0	132. Epoxiconazole	4.529	330.0	121.1	101.0	202. Eprinomectin	6.466	914.6	186.1	154.1
63. Ethiofencarb	3.406	226.0	107.0	164.0	133. Etaconazole	4.552	328.1	159.0	55.0	203. Abamectin B1a	6.544	890.6	305.4	567.2
64. Ametryn	3.447	228.1	68.1	186.1	134. Fipronil*	4.571	436.9	332.0	252.0	204. Fenazaquin	6.559	307.1	161.0	131.1
65. Chlorotoluron	3.450	213.0	72.1	46.1	135. Neburon	4.635	275.0	57.1	88.1	205. Doramectin	6.733	916.6	331.2	593.4
66. Metobromuron	3.483	259.0	170.0	148.1	136. Flusilazole	4.646	316.1	247.1	165.1	206. Ivermectin	6.893	892.6	551.4	569.4
67. Prophan	3.500	180.1	120.2	77.1	137. Fenoxycarb	4.653	302.2	88.1	116.1	*Detected in ESI- mode				
68. Flutriafol	3.508	302.0	70.1	123.0	138. Picoxystrobin	4.674	368.0	145.0	205.0					
69. Methoprotetryne	3.532	272.1	170.0	198.1	139. Rotenone	4.683	395.1	213.1	192.1					
70. Forchlorfenuron	3.536	248.1	129.0	93.0	140. Tebufenozide	4.719	353.2	133.1</						



Raptor ARC-18 LC Columns (USP L1)

- Ideal for high-throughput LC-MS/MS applications with minimal sample preparation.
- Well-balanced retention profile for better detection and integration of large, multiclass analyte lists.
- Sterically protected to endure low-pH mobile phases without sacrificing retention or peak quality.
- Part of Restek's Raptor LC column line featuring 1.8, 2.7, and 5 μm SPP core-shell silica.

Stationary Phase Category: C18, octadecylsilane (L1)
 Ligand Type: Sterically protected C18
 Particle: 1.8 μm , 2.7 μm , or 5 μm superficially porous particle (SPP or "core-shell" particle) silica
 Pore Size: 90 Å
 Carbon Load: 7% (1.8 μm), 7% (2.7 μm), 5% (5 μm)
 End-Cap: no
 Surface Area: 125 m^2/g (1.8 μm), 130 m^2/g (2.7 μm), or 100 m^2/g (5 μm)
Recommended Usage:
 pH Range: 1.0–8.0
 Maximum Temperature: 80 °C
 Maximum Pressure: 1034 bar/15,000 psi* (1.8 μm), 600 bar/8700 psi (2.7 μm); 400 bar/5800 psi (5 μm)
 * For maximum lifetime, recommended maximum pressure for 1.8 μm particles is 830 bar/12,000 psi.

Properties:

- Well-balanced retention profile.
- Sterically protected and acid resistant to resist harsh, low-pH mobile phases.
- Ideal for use with sensitive detectors like mass spec.

Switch to an ARC-18 column when:

- You are analyzing large, multiclass lists by LC-MS/MS.
- Strongly acidic (pH 1–3) mobile phases are required.

ordering notes

Certificates of analysis for new Restek LC columns are now provided electronically. To view and download, visit www.restek.com/documentation then enter your cat.# and serial #.

ID	Length	qty.	cat.#
2.7 μm Particles Raptor ARC-18			
2.1 mm	30 mm	ea.	9314A32
	50 mm	ea.	9314A52
	100 mm	ea.	9314A12
3.0 mm	150 mm	ea.	9314A62
	30 mm	ea.	9314A3E
	50 mm	ea.	9314A5E
	100 mm	ea.	9314A1E
	150 mm	ea.	9314A6E
4.6 mm	30 mm	ea.	9314A35
	50 mm	ea.	9314A55
	100 mm	ea.	9314A15
	150 mm	ea.	9314A65

Raptor EXP Guard Column Cartridges

- Free-Turn architecture lets you change cartridges by hand without breaking inlet/outlet fluid connections—no tools needed.
- Patented titanium hybrid ferrules can be installed repeatedly without compromising high-pressure seal.
- Auto-adjusting design provides ZDV (zero dead volume) connection to any 10-32 female port.
- Guard column cartridges require EXP direct connect holder (cat.# 25808).
- Pair with EXP hand-tight fitting (cat.# 25937–25938) for tool-free installation.



Description	Particle Size	Length	ID	qty.	cat.#
Raptor ARC-18 EXP Guard Column Cartridge	2.7 μm	5 mm	2.1 mm	3-pk.	9314A0252

Maximum cartridge pressure: 1034 bar/15,000 psi* (UHPLC); 600 bar/8700 psi (2.7 μm); 400 bar/5800 psi (5 μm).

* For maximum lifetime, recommended maximum pressure for UHPLC particles is 830 bar/12,000 psi.

Intellectual Property: optimizetech.com/patents

LC Multiresidue Pesticide Kit

- Accurately detect and quantify pesticides of global food safety concern in a wide range of fruits, vegetables, and other commodities by LC-MS/MS.
- Full kit contains 204 compounds of interest, covering many LC-determined pesticides listed by government agencies; individual ampuls also sold separately.
- Formulated and grouped for maximum long-term stability.
- Quantitatively tested to confirm composition; detailed support documentation provided.
- Optimized multiresidue pesticide method is offered free of charge; downloadable XLS file includes conditions and transition tables.
- Restek is your complete supplier for world-class LC-MS/MS multiresidue pesticide analysis: reference and internal standards, Ultra and Pinnacle DB LC columns, Q-sep QuEChERS sample prep products, accessories, and more!



Cat. # 31972: LC Multiresidue Pesticide Standard #1 (13 components)

Organophosphorus Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
Acephate (30560-19-1)
Carbaryl (Sevin) (63-25-2)
Dicrotophos (141-66-2)
Dimethoate (60-51-5)
Dimethomorph (110488-70-5)
Isocarboxiphos (24353-61-5)
Methamidophos (10265-92-6)
Mevinphos (7786-34-7)
Monocrotophos (6923-22-4)
Omethoate (1113-02-6)
Temephos (Abate) (3383-96-8)
Trichlorfon (Dylox) (52-68-6)
Vamidothion (Vamidoate) (2275-23-2)

Cat. # 31973: LC Multiresidue Pesticide Standard #2 (16 components)

Carbamate/Uron Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
Alanycarb (83130-01-2)
Aldicarb (116-06-3)
Aldicarb sulfone (1646-88-4)
Aldicarb sulfoxide (1646-87-3)
Benfuracarb (82560-54-1)
Butocarboxim (34681-10-2)
Butoxycarbonyl (34681-23-7)
Ethiofencarb (29973-13-5)
Furathiocarb (65907-30-4)
Methabenzthiazuron (18691-97-9)
Methiocarb (2032-65-7)
Methomyl (16752-77-5)
Oxamyl (23135-22-0)
Tebuthiuron (34014-18-1)
Thidiazuron (51707-55-2)
Thiophanate-methyl (23564-05-8)

Cat. # 31974: LC Multiresidue Pesticide Standard #3 (38 components)

Carbamate/Uron Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
Bendiocarb (22781-23-3)
Bifenazate (149877-41-8)
Carbofuran (1563-66-2)
Chlorfluazuron (71422-67-8)
Chloroxuron (1982-47-4)
Chlortoluron (15545-48-9)
Cycluron (2163-69-1)
Diethofencarb (87130-20-9)
Diflufenazuron (35367-38-5)
Dioxacarb (6988-21-2)
Diuron (330-54-1)
Fenobucarb (BPMC) (3766-81-2)

Fenoxycarb (72490-01-8)
Fenuron (101-42-8)
Flufenoxuron (101463-69-8)
Fluometuron (2164-17-2)
Forchlorfenuron (68157-60-8)
Hexaflumuron (86479-06-3)
3-Hydroxycarbofuran (16655-82-6)
Indoxacarb (173584-44-6)
Iprovalicarb (140923-17-7)
Isoprocab (2631-40-5)
Isoproturon (34123-59-6)
Linuron (330-55-2)
Lufenuron (103055-07-8)
Metobromuron (3060-89-7)
Monolinuron (1746-81-2)
Neburon (555-37-3)
Novaluron (116714-46-6)
Pirimicarb (23103-98-2)
Promecarb (28249-77-6)
Propham (122-42-9)
Propoxur (Baygon) (114-26-1)
Pyraclostrobin (175013-18-0)
Siduron (1982-49-6)
Teflufenazuron (83121-18-0)
Thiobencarb (28249-77-6)
Triflurumuron (64628-44-0)

Cat. # 31975: LC Multiresidue Pesticide Standard #4 (63 components)

Organonitrogen Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
Abamectin (71751-41-2)
Acetamidiprid (135410-20-7)
Ametryn (834-12-8)
Amitraz (33089-61-1)
Azoxyrobin (131860-33-8)
Benalaxyl (17626-11-4)
Benzoximate (29104-30-1)
Boscalid (188425-85-6)
Butafenacil (134605-64-4)
Carbetamide (16118-49-3)
Carfentrazon ethyl (128639-02-1)
Chlorantraniliprole (500008-45-7)
Clofentezine (74115-24-5)
Cymoxanil (57966-95-7)
Cyprodinil (121552-61-2)
Cyromazine (66215-27-8)
Dimoxystrobin (149961-52-4)
Dinotefuran (165252-70-0)
Doramectin (117704-25-3)
Eprinomectin (123997-26-2)
Famoxadon (131807-57-3)
Fenazacquin (120928-09-8)
Fenhexamid (126833-17-8)
(E)-Fenpyroximate (134098-61-6)
Flonicamid (158062-67-0)
Fluazinam (79622-59-6)*
Fludioxonil (131341-86-1)
Fluoxastrobin (361377-29-9)
Flutolanil (66332-96-5)

Furalaxyl (57646-30-7)
Halofenozide (112226-61-6)
Imazalil (35554-44-0)
Imidacloprid (138261-41-3)
Ivermectin (70288-86-7)
Kresoxim methyl (143390-89-0)
Mandipropamid (374726-62-2)
Mepanipyrim (110235-47-7)
Meproil (55814-41-0)
Metaflumizone (139968-49-3)
Metalaxyl (57837-19-1)
Methoxyfenozide (161050-58-4)
Moxidectin (113507-06-5)
Myclobutanil (88671-89-0)
Nitenpyram (120738-89-8)
Oxadixyl (77732-09-3)
Picoxystrobin (117428-22-5)
Piperonyl butoxide (51-03-6)
Prochloraz (67747-09-5)
Prometon (1610-18-0)
Pymetrozine (123312-89-0)
Pyraclostrobin (175013-18-0)
Pyrimethanil (53112-28-0)
Pyriproxyfen (95737-68-1)
Quinoxifen (124495-18-7)
Rotenone (83-79-4)
Sechumeton (26259-45-0)
Spiroxamine (118134-30-8)
Tebufenozide (112410-23-8)
Tebufenpyrad (119168-77-3)
Terbufenol (33693-04-8)
Triadimefon (43121-43-3)
Trifloxystrobin (141517-21-7)
Zoxamide (156052-68-5)

Cat. # 31976: LC Multiresidue Pesticide Standard #5 (30 components)

Organonitrogen Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
Acibenzolar-S-methyl (135158-54-2)
Bupirimate (41483-43-6)
Buprofezin (69327-76-0)
Carboxin (5234-68-4)
Clethodim (99129-21-2)
Clothianidin (210880-92-5)
Cyazofamid (120116-88-3)
Ethiprole (181587-01-9)
Ethofumesate (26225-79-6)
Fenamidone (161326-34-7)
Fipronil (120068-37-3)
Flubendiamide (272451-65-7)
Flufenacet (Fluthiamide) (142459-58-3)
Hexythiazox (78587-05-0)
Mefenacet (73250-68-7)
Mesotrione (104206-82-8)
Methoprotetryn (841-06-5)
Metribuzin (21087-64-9)
Prometryne (7287-19-6)

Propargite (2312-35-8)
Prothioconazole (178928-70-6)
Pyridaben (96489-71-3)
Simetryn (1014-70-6)
Sulfentrazon (122836-35-5)
Terbutryn (886-50-0)
Thiabendazole (148-79-8)
Thiacloprid (111988-49-9)
Thiamethoxam (153719-23-4)
Thiofanox (39196-18-4)
Tricyclazole (Beam) (41814-78-2)

Cat. # 31977: LC Multiresidue Pesticide Standard #6 (28 components)

Organonitrogen Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
Baycor (Birtanol) (55179-31-2)
Bromuconazole (116255-48-2)
Cyproconazole (94361-06-5)
Diflubenbutrazol (75736-33-3)
Difenoconazole (119446-68-3)
Diniconazole (83657-24-3)
Epoxiconazole (133855-98-8)
Etaconazole (60207-93-4)
Ethinilol (23947-60-6)
Etoazole (153233-91-1)
Fenarimol (60168-88-9)
Fenbuconazole (114369-43-6)
Fluquinconazole (136426-54-5)
Flusilazole (85509-19-9)
Flutriafol (76674-21-0)
Fuberidazole (3878-19-1)
Hexaconazole (79983-71-4)
Iaconazole (125225-28-7)
Metconazole (125116-23-6)
Nuarimol (63284-71-9)
Paclobutrazol (76738-62-0)
Penconazole (66246-88-6)
Propiconazole (Tilt) (60207-90-1)
Tebuconazole (107534-96-3)
Tetraconazole (112281-77-3)
Triadimenol (55219-65-3)
Triflumizole (68694-11-1)
Triticonazole (131983-72-7)

Cat. # 31978: LC Multiresidue Pesticide Standard #7 (7 components)

Organonitrogen Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
Emamectin-benzoate (155569-91-8)
Fenpropimorph (67564-91-4)
Spinetoram (J&L) (935545-74-7)**
Spinosad (A&D) (168316-95-8)†
Spirodiclofen (148477-71-8)
Spiromesifen (283594-90-1)
Spirotetramat (203313-25-1)

Cat. # 31979: LC Multiresidue Pesticide Standard #8

Organonitrogen Compounds
100 µg/mL in acetonitrile, 1 mL/ampul
Hydramethylnon (67485-29-4)

Cat. # 31980: LC Multiresidue Pesticide Standard #9 (7 components)

Carbamate/Uron Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
Aminocarb (2032-59-9)
Desmedipham (13684-56-5)
Formetanate HCL (23422-53-9)
Mexacarbate (Zectran) (315-18-4)
Monceren (Pencycuron) (66063-05-6)
Phenmedipham (13684-63-4)
Propamocarb free base (24579-73-5)

Cat. # 31981: LC Multiresidue Pesticide Standard #10

Carbamate/Uron Compounds
100 µg/mL in methanol, 1 mL/ampul
Carbendazim (10605-21-7)

*In this standard, fluzinam should only be used for qualitative analysis. A single-component standard (cat. # 31982) is available for quantitative analysis.

**This reference material contains both the Spinetoram J and L isomers (187166-40-1 and 187166-15-0); however, CAS# 935545-74-7 is displayed on the certificate as this is the neat material dissolved in the solution. CAS# 935545-74-7 is a blend of Spinetoram J and L and the ratio of each material isomer are displayed on your certificate of analysis.

†This reference material contains Spinosad A and D isomers (131929-60-7 and 131929-63-0); however, CAS# 168316-95-8 is displayed on the certificate as this is the neat material dissolved in the solution. CAS# 168316-95-8 is a blend of Spinosad A and D and the ratio of each material isomer are displayed on your certificate of analysis.

Description	CRM?	Min Shelf Life on Ship Date	Shipping Conditions	Storage Temp.	qty.	cat.#
LC Multiresidue Pesticide Kit	Yes	6 months	On Ice	-20 °C or colder	kit	31971



Q-sep QuEChERS Extraction Salts

- Free-flowing salts transfer easily and completely.
- Easy-open packets eliminate the need for a second empty tube for salt transfer.
- Convenient slim packets fit perfectly into tubes to prevent spills.
- Ready-to-use tubes, no glassware required.
- Pre-weighed, ultra-pure extraction salts.
- Ideal for original unbuffered, AOAC (2007.01), and European (EN 15662) QuEChERS methods.

Description	Material	Method	qty.	cat.#
Q-sep QuEChERS Extraction Kit	4 g MgSO ₄ , 1 g NaCl with 50 mL Centrifuge Tube	Original unbuffered	50 packets & 50 tubes	25848

DHS – disodium hydrogen citrate sesquihydrate; MgSO₄ – magnesium sulfate; NaCl – sodium chloride; NaOAc – sodium acetate; TSCD – trisodium citrate dihydrate



Q-sep QuEChERS dSPE Tubes for Extract Cleanup

Fast, Simple Sample Prep for Multiresidue Pesticide Analysis

- Packaged in foil subpacks of 10 for enhanced protection and storage stability.
- Ready-to-use tubes, no glassware required.
- Pre-weighed, ultra-pure sorbents.
- Support original unbuffered, AOAC (2007.01), European (EN 15662), and mini-multiresidue QuEChERS methods.

Description	Material	Method	Type	Volume	qty.	Similar to Part #	cat.#
Q-sep QuEChERS dSPE Tubes	150 mg MgSO ₄ , 25 mg PSA	Original unbuffered, EN 15662, mini-multiresidue	2 mL Micro-Centrifuge Tubes Prefilled with dSPE Materials for Cleanup (1 mL Extract)	2 mL	100 tubes	Agilent 5982-5021	26215

Note: No entry in the Method column refers to dSPE formulations not specifically included in one of the cited references. These products can be used to accommodate the various needs of specific matrices not directly met by the cited references.

LC Stainless-Steel Capillary Tubing

- 316-grade stainless steel.
- Precise precut lengths.
- Clean and smooth surface finish.
- Color coded for easy identification.
- Tight tolerance: OD and ID +/-0.001".



Description	Color	ID	OD	Length	Material	Max Pressure	qty.	cat.#
LC Capillary Tubing	Red	0.005" (0.127 mm)	1/16"	5 cm	316-grade stainless steel	27,850 psi	3-pk.	25813
	Red	0.005" (0.127 mm)	1/16"	10 cm	316-grade stainless steel	27,850 psi	3-pk.	25814
	Red	0.005" (0.127 mm)	1/16"	20 cm	316-grade stainless steel	27,850 psi	3-pk.	25815
	Red	0.005" (0.127 mm)	1/16"	30 cm	316-grade stainless steel	27,850 psi	3-pk.	25816
	Yellow	0.007" (0.178 mm)	1/16"	5 cm	316-grade stainless steel	26,610 psi	3-pk.	25817
	Yellow	0.007" (0.178 mm)	1/16"	10 cm	316-grade stainless steel	26,610 psi	3-pk.	25818
	Yellow	0.007" (0.178 mm)	1/16"	20 cm	316-grade stainless steel	26,610 psi	3-pk.	25819
	Yellow	0.007" (0.178 mm)	1/16"	30 cm	316-grade stainless steel	26,610 psi	3-pk.	25820
	Blue	0.010" (0.254 mm)	1/16"	5 cm	316-grade stainless steel	25,160 psi	3-pk.	25821
	Blue	0.010" (0.254 mm)	1/16"	10 cm	316-grade stainless steel	25,160 psi	3-pk.	25822
	Blue	0.010" (0.254 mm)	1/16"	20 cm	316-grade stainless steel	25,160 psi	3-pk.	25823
	Blue	0.010" (0.254 mm)	1/16"	30 cm	316-grade stainless steel	25,160 psi	3-pk.	25824
	Orange	0.020" (0.508 mm)	1/16"	5 cm	316-grade stainless steel	20,230 psi	3-pk.	25825
	Orange	0.020" (0.508 mm)	1/16"	10 cm	316-grade stainless steel	20,230 psi	3-pk.	25826
	Orange	0.020" (0.508 mm)	1/16"	20 cm	316-grade stainless steel	20,230 psi	3-pk.	25827
	Orange	0.020" (0.508 mm)	1/16"	30 cm	316-grade stainless steel	20,230 psi	3-pk.	25828

Atrazine-d5 Standard

Isotopically labeled to provide the best approach for pesticide residue quantification.

Atrazine-d5 (163165-75-1)

Description	CAS #	Conc. in Solvent	CRM?	Min Shelf Life on Ship Date	Max Shelf Life on Ship Date	Shipping Conditions	Storage Temp.	qty.	cat.#
Atrazine-d5	163165-75-1	100 µg/mL in acetonitrile, 1 mL/ampul	Yes	6 months	36 months	Ambient	10 °C or colder	ea.	31984

Carbaryl-d7 Standard

Isotopically labeled to provide the best approach for pesticide residue quantification.

Carbaryl-d7 (362049-56-7)

Description	CAS #	Conc. in Solvent	CRM?	Min Shelf Life on Ship Date	Max Shelf Life on Ship Date	Shipping Conditions	Storage Temp.	qty.	cat.#
Carbaryl-d7	362049-56-7	100 µg/mL in acetonitrile, 1 mL/ampul	Yes	6 months	31 months	Ambient	10 °C or colder	ea.	31985

Diazinon-d10 Standard

Isotopically labeled to provide the best approach for pesticide residue quantification.

Diazinon-d10 (diethyl-d10) (100155-47-3)

Description	CAS #	Conc. in Solvent	CRM?	Min Shelf Life on Ship Date	Max Shelf Life on Ship Date	Shipping Conditions	Storage Temp.	qty.	cat.#
Diazinon-d10 (diethyl-d10)	100155-47-3	100 µg/mL in acetonitrile, 1 mL/ampul	Yes	6 months	36 months	Ambient	10 °C or colder	ea.	31986

Dichlorvos-d6 Standard

Isotopically labeled to provide the best approach for pesticide residue quantification.

Dichlorvos-d6 (203645-53-8)

Description	CAS #	Conc. in Solvent	CRM?	Min Shelf Life on Ship Date	Max Shelf Life on Ship Date	Shipping Conditions	Storage Temp.	qty.	cat.#
Dichlorvos-d6	203645-53-8	100 µg/mL in acetone, 1 mL/ampul	Yes	3 months	12 months	Ambient	10 °C or colder	ea.	31987

Dimethoate-d6 Standard

Isotopically labeled to provide the best approach for pesticide residue quantification.

Dimethoate-d6 (1219794-81-6)

Description	CAS #	Conc. in Solvent	CRM?	Min Shelf Life on Ship Date	Max Shelf Life on Ship Date	Shipping Conditions	Storage Temp.	qty.	cat.#
Dimethoate-d6	1219794-81-6	100 µg/mL in acetonitrile, 1 mL/ampul	Yes	6 months	36 months	Ambient	10 °C or colder	ea.	31988

Diuron-d6 Standard

Isotopically labeled to provide the best approach for pesticide residue quantification.

Diuron-d6 (1007536-67-5)

Description	CAS #	Conc. in Solvent	CRM?	Min Shelf Life on Ship Date	Max Shelf Life on Ship Date	Shipping Conditions	Storage Temp.	qty.	cat.#
Diuron-d6	1007536-67-5	100 µg/mL in acetonitrile, 1 mL/ampul	Yes	6 months	31 months	Ambient	10 °C or colder	ea.	31989

Linuron-d6 Standard

Isotopically labeled to provide the best approach for pesticide residue quantification.

Linuron-d6 (1219804-76-8)

Description	CAS #	Conc. in Solvent	CRM?	Min Shelf Life on Ship Date	Max Shelf Life on Ship Date	Shipping Conditions	Storage Temp.	qty.	cat.#
Linuron-d6	1219804-76-8	100 µg/mL in acetonitrile, 1 mL/ampul	Yes	6 months	31 months	Ambient	10 °C or colder	ea.	31990