



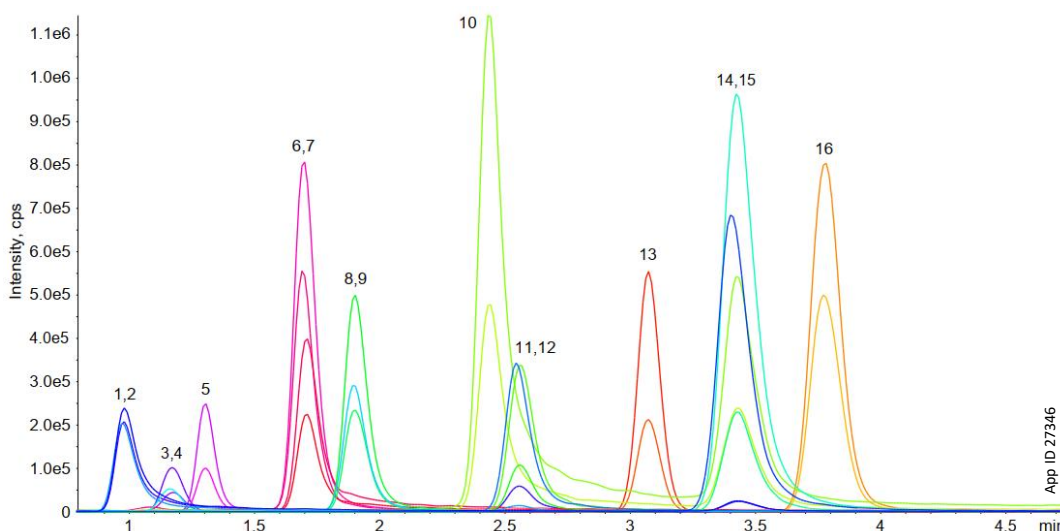
# Analysis of Underivatized Anionic and Cationic Pesticides in Reversed Phase and HILIC Modes Using a Single Mixed-mode HPLC Column

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## Overview

Analysis of polar pesticides presents multiple challenges including adequate retention, separation of critical pairs, and reproducibility, to name a few. Traditionally, multiple columns are utilized for analyzing different class of polar pesticides, which results in dedicating two instruments, two different HPLC column selectivities, and reduced lab throughput. In this application note we show an efficient approach to a unique HPLC selectivity that provides optimal separation of various anionic and cationic polar pesticide classes using a single HPLC column. The Luna Polar Pesticides HPLC column was effective in retaining both anionic and cationic pesticides, showing that the same column can be used for both positive and negative polarity modes for analysis. The versatile selectivity of this column enables Reversed Phase and HILIC retention of anionic and cationic pesticides as evident from **Figure 1** and **Figure 2**, respectively.

**Figure 1.** Underivatized Anionic Pesticide Analysis on a Luna Polar Pesticides HPLC Column.



## LC Conditions

**Column:** Luna 3  $\mu$ m Polar Pesticides  
**Dimensions:** 100 x 2.1 mm  
**Part No.:** [OOD-4798-AN](#)  
**Guard:** SecurityGuard™ ULTRA for Polar Pesticides: [AJ0-8789](#)  
**Mobile Phase:** A: 0.3 % Formic Acid in Water  
 B: 0.3 % Formic Acid in Acetonitrile  
**Gradient:**

Time (min)	%B
0	2
0.5	2
6	20
7	90
9	90
9.1	2
12	2

**Flow Rate:** 0.3 mL/min  
**Injection Volume:** 1  $\mu$ L  
**Temperature:** 40 °C  
**Detection:** MRM  
**Detector:** SCIEX® 7500

**Analyte Concentrations:** 50 ng/mL

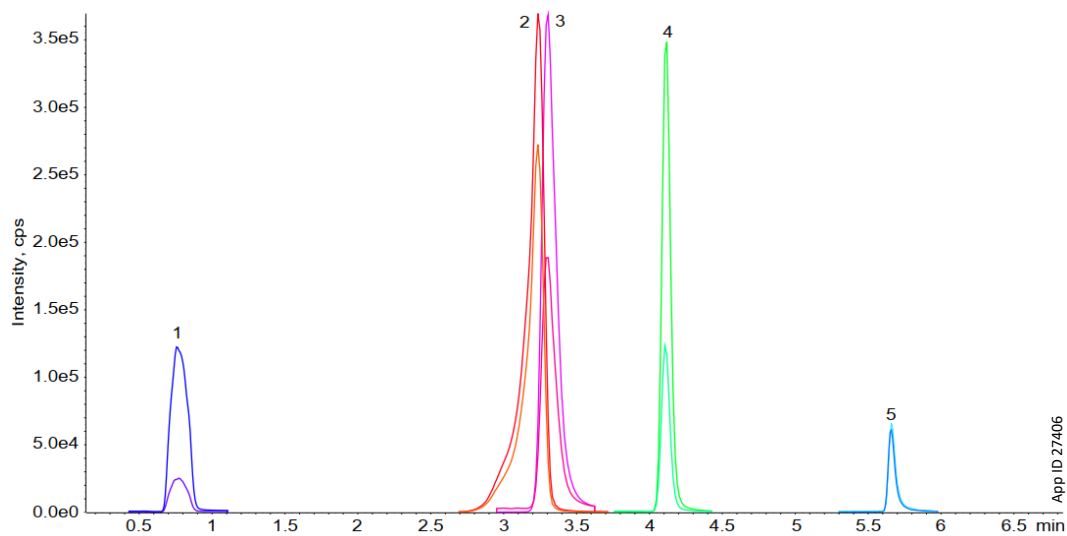
Peak No.	Analyte	Retention Time (min)	Q1 (m/z)	Q3 (m/z)	Peak No.	Analyte	Retention Time (min)	Q1 (m/z)	Q3 (m/z)
1	AMPA	0.97	110	79	9	N-Acetyl Glufosinate-D <sub>3</sub>	1.9	225	62
2	AMPA- <sup>13</sup> C, <sup>15</sup> N	0.97	112	79	10	Phosphonic Acid	2.44	81	63
3	Maleic Hydrazide-D <sub>2</sub>	1.16	113	42	11	Ethephon-D <sub>4</sub>	2.55	147	79
4	Maleic Hydrazide	1.17	111	82	12	Ethephon	2.56	143	107
5	Glufosinate	1.3	180	63	13	Chlorate	3.07	83	67
6	MPPA	1.7	151	63	14	Fosetyl Al-D <sub>15</sub>	3.41	114	82
7	Glyphosate	1.71	151	107	15	Fosetyl Al	3.43	109	81
8	N-Acetyl-Glufosinate	1.9	168	63	16	Perchlorate	3.78	99	83
			168	79				101	85

## MRM Conditions

**Polarity:** Negative  
**Gas Temperature:** 450 °C  
**GS1:** 40 psi  
**GS2:** 30 psi  
**CUR:** 40 psi  
**IS:** -4500 V



**Figure 2.** Underivatized Cationic Pesticide Analysis on a Luna™ Polar Pesticides HPLC Column.



Peak No.	Analyte	Retention Time (min)	Q1 (m/z)	Q3 (m/z)
1	Ethyl Thiourea	0.77	103	44
			103	86
2	Mepiquat	3.2	189	144
			189	102
3	Propamocarb	3.28	114	98
			114	70
4	Oxamatriine	4.09	265	136
			265	205
5	Paraquat	5.64	185	170
			185	169

**LC Conditions**

**Column:** Luna 3 µm Polar Pesticides  
**Dimensions:** 100 x 2.1 mm  
**Part No.:** 00D-4798-AN  
**Guard:** SecurityGuard™ ULTRA for Polar Pesticides: [AJ0-8789](#)  
**Mobile Phase:** A: 50 mM Ammonium Formate in Water, adjust pH to 3 with Formic Acid  
 B: Acetonitrile

Gradient	Time (min)	%B
	0	97
	0.5	97
	4	70
	5	40
	6	40
	6.1	97
	10	97

**Flow Rate:** 0.5 mL/min  
**Injection Volume:** 5 µL  
**Temperature:** 40 °C

**Detection:** MRM  
**Detector:** SCIEX® 7500

**Analyte Concentrations:** 40 ng/mL

**MRM Conditions**

**Polarity:** Positive  
**Gas Temperature:** 450 °C  
**GS1:** 40 psi  
**GS2:** 40 psi  
**CUR:** 50 psi  
**IS:** 4500 V



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