Featured Application: *Glyphosate on Raptor Polar X*

Simple Large Volume Injection Method for Trace-Level Glyphosate in Bottled Drinking Water

- Analyze glyphosate without derivatization or ion pairing.
- Unique Raptor Polar X column provides good retention and efficient elution, resulting in better peak shape.
- Direct large volume injection makes it easy to increase sensitivity at ppt levels.

The analysis of glyphosate in water is challenging primarily because it is not retained on reversed-phase columns and its response is often poor due to chelation with metal surfaces along the sample path through the LC-MS/MS system. Derivatization and ion-pairing reagents are often used to improve performance, but they can be unfriendly to the instrument and require additional sample preparation time. Using a Raptor Polar X column is a better alternative because the novel stationary phase has an affinity for polar anionic compounds, such as glyphosate, and it provides both effective retention and efficient elution.

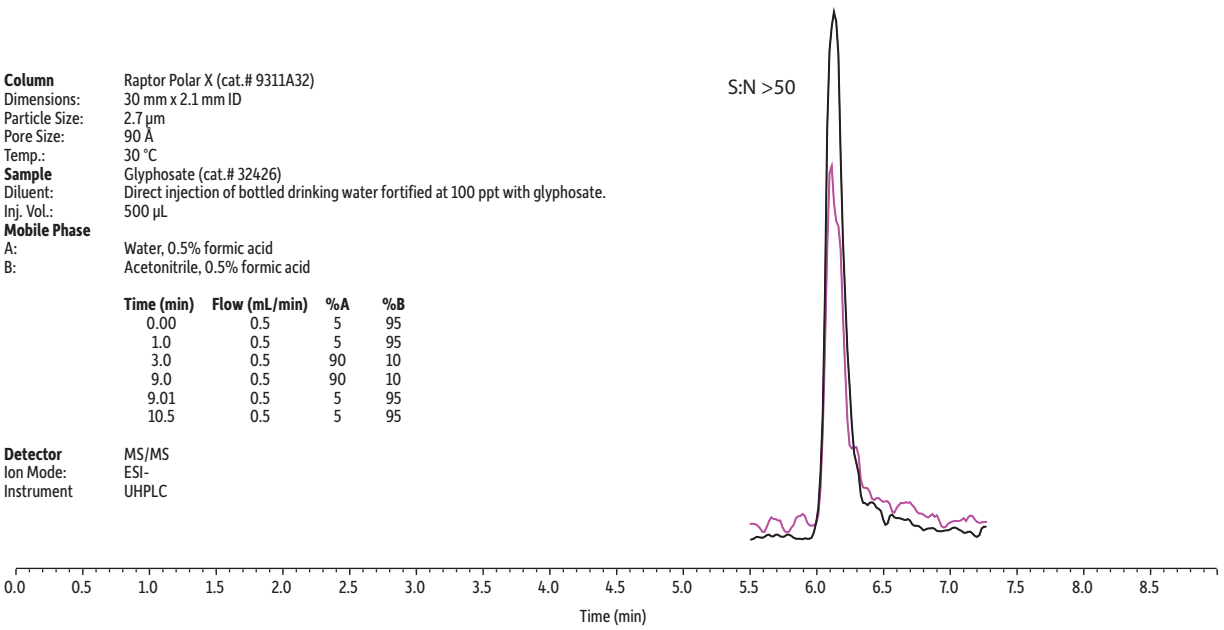
In the method for glyphosate in water shown here, an anion-exchange mechanism in the column provides enough retention under the initial mobile phase conditions to allow large volumes (500 µL) of bottled water to be injected, which is a very simple way to improve low-level sensitivity. To achieve the best retention/elution characteristics, the mobile phase additive and pH were carefully chosen to provide a charge state that leads to adequate retention and optimal sensitivity. In addition, a one-time passivation of the LC system (without an analytical or guard column in the flow path) helped prevent undesirable chelation and a good response was observed at 100 ppt (S:N > 50).

Peaks	t_R (min)	Conc. (ng/L)	Precursor Ion	Product Ion 1	Product Ion 2
1. Glyphosate	6.13	100	168.10	62.95	78.95

Column	Raptor Polar X (cat.# 9311A32)
Dimensions:	30 mm x 2.1 mm ID
Particle Size:	2.7 µm
Pore Size:	90 Å
Temp.:	30 °C
Sample	Glyphosate (cat.# 32426)
Diluent:	Direct injection of bottled drinking water fortified at 100 ppt with glyphosate.
Inj. Vol.:	500 µL
Mobile Phase	
A:	Water, 0.5% formic acid
B:	Acetonitrile, 0.5% formic acid

Time (min)	Flow (mL/min)	%A	%B
0.00	0.5	5	95
1.0	0.5	5	95
3.0	0.5	90	10
9.0	0.5	90	10
9.01	0.5	5	95
10.5	0.5	5	95

Detector	MS/MS
Ion Mode:	ESI-
Instrument	UHPLC



Featured Products

Reference Standards	Analytical Column	Maintenance & Accessories
		
Glyphosate cat.# 32426 & 32427	**Raptor Polar X column** cat.# 9311A32	**Passivation solution** cat.# 32475

Raptor Polar X LC Columns

- Reliably analyze a wide variety of polar analytes (acidic, basic, and neutral) without time-consuming derivatization or complex ion pairing.
- Switch between HILIC and ion-exchange retention modes with simple mobile phase changes and short equilibration times.
- 2.7 µm Raptor core-shell particles provide the speed of SPP with greater efficiency and capacity than 5 µm particles.
- Ideal for increasing sensitivity and selectivity in LC-MS analyses.

ID	Length	qty.	cat.#
2.7 µm Particles			
2.1 mm	30 mm	ea.	9311A32
	50 mm	ea.	9311A52
	100 mm	ea.	9311A12

Glyphosate Standard

Glyphosate (N-(phosphonomethyl)glycine) (1071-83-6)

Description	CAS #	Conc. in Solvent	cat.#
Glyphosate	1071-83-6	1,000 µg/mL in DI water, 1 mL/ampul	32426 (ea.)
	1071-83-6	1,000 µg/mL in DI water, 5 mL/ampul	32427 (ea.)

LC Passivation Solution

Methylenediphosphonic acid (Medronic Acid) (1984-15-2)

Description	CAS #	Conc. in Solvent	cat.#
Methylenediphosphonic acid (Medronic Acid)	1984-15-2	1,760 µg/mL, Methanol (HPLC grade)/Water (50:50), 1mL/ampul	32475 (ea.)

Related Products

Survival Kit for HPLC, PEEK

For start-up and maintenance in all HPLC systems.

25322

The PEEK Survival Kit is an invaluable parts kit that contains tubing, fittings, and tools essential for setting up and maintaining your HPLC system: PEEK tubing, connectors, and elbows, PTFE tubing, a tubing cutter and extra blades, a ValvTool wrench, open-end wrenches, and more.

Kit includes:

- PEEK Column Connector (beige, round body), 10-pk.
- PEEK Tubing, 1/16" OD x 0.005" ID x 3 m (red stripe), ea.
- PEEK Tubing, 1/16" OD x 0.007" ID x 3 m (yellow stripe), ea.
- PEEK Tubing, 1/16" OD x 0.010" ID x 3 m (blue stripe), ea.
- PEEK Tubing Elbow, 90°, 5-pk.
- PEEK Tubing Elbow, 180°, 5-pk.
- PTFE Tubing, 1/8" OD x 0.063" (1.6 mm) ID x ea.
- PTFE Tubing, 1/8" OD x 0.094" (2.4 mm) ID x ea.
- Tubing Clip, 5-pk.
- ValvTool Wrench, ea.
- Open-End Wrenches, 1/4" x 5/16", 2-pk.*
- Clean-Cut Tubing Cutter, ea.
- Replacement Blade for Clean-Cut Cutter, ea.
- PEEK Union Connector 1/16", 2-pk.
- Mobile Phase Sparge Filter, 2 µm, ea.
- Mobile Phase Sparge Filter, 10 µm, ea.

Description	qty.	cat.#
Survival Kit for HPLC	kit	25322

*Kit contains 1 wrench, replacement (cat.# 20110) is a 2-pk.

Bluestem Glass Solvent Filter

Prevent the particulates and microbial growth in your LC solvents from entering your instrument with the new Restek Bluestem glass solvent filter.

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Description	qty.	cat.#
Frit Adaptor, PTFE	4-pk.	26392
Glass Solvent Filter, 15 µm frit	ea.	26431

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