

# HPLC Analysis of Phenylurea Pesticides

Use New Restek Reference Mixes and Restek HPLC Columns for Reliable Results

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- ✓ All materials needed for analysis of phenylurea pesticides.
- ✓ Mix formulation keeps poorly soluble analytes in solution.
- ✓ HPLC analysis using an Ultra C18 column; confirmation using an Ultra Cyano column.

Phenylurea pesticides are used to control a wide range of broadleaf weeds, grasses, and mosses, for both selective and total weed control. While drinking water usually is free of pesticides and herbicides after treatment, when violations are reported they are mainly due to phenylurea, triazine, or phenoxy-acid pesticides. Phenylurea pesticides in ground and drinking water are potential endocrine disrupters.

The US Environmental Protection Agency developed Method 532 for determining phenylurea compounds in drinking water. Solid-phase extraction (SPE) cartridges containing a bonded C18 organic phase are

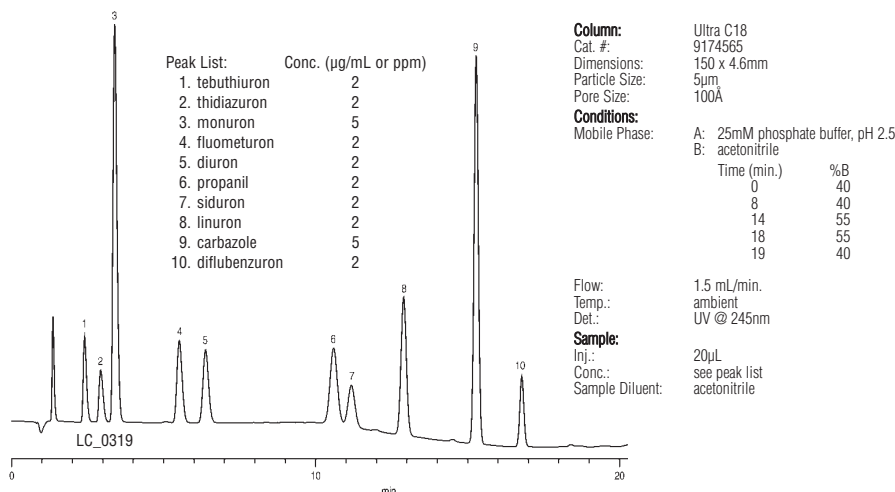
used to extract the pesticides from the sample, the analytes are eluted from the cartridges with methanol, and the concentrated extracts are analyzed by HPLC with ultraviolet detection. Phenylurea pesticides are not suitable for gas chromatography because they are thermally unstable.

Restek chemists have formulated a calibration solution and surrogate standard for determining target phenylurea pesticides in the latest version of EPA Method 532. The calibration mix contains 200µg/mL of each pesticide in acetonitrile, the organic mobile phase in the HPLC assay. Because diflufenuron has

limited solubility in acetonitrile, and thidiazuron is especially difficult to dissolve, we include a small amount of acetone in the formulation to enhance solubility of these two compounds. The early-eluting acetone does not interfere with any of the analytes. Our surrogate standard contains monuron and carbazole at 500µg/mL each in 50:50 methanol/acetonitrile (monuron is soluble in methanol, carbazole is soluble in acetonitrile).

Method 532 requires two HPLC columns: a C18 column plus a confirmation column with a dissimilar stationary phase. Figure 1 shows an analysis of the phenylurea pesticides and surrogates on Restek's Ultra C18 column. The high carbon load of this column ensures excellent retention and selectivity. The phenylurea mix and the surrogates also are separated well, with one peak reversal (Figure 2) on an Ultra Cyano cyanopropyl stationary phase—our recommendation for the confirmation column. If your laboratory performs analyses for phenylurea pesticides, Restek is now the source for all of the reference materials and HPLC columns you need.

**Figure 1** Phenylurea pesticides are resolved to baseline in less than 20 minutes by an Ultra C18 column.



## Ultra C18 HPLC Column

fully end-capped; pore size: 100Å; pH range: 2.5 to 7.5; temperature limit: 80°C; carbon load: 20%

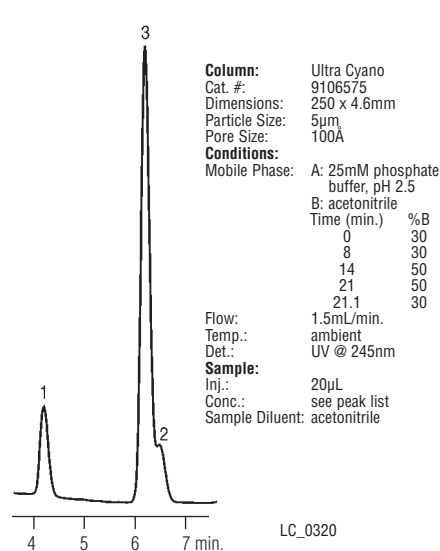
5µm, 150 x 4.6mm, cat. # 9174565, (ea)

## Ultra Cyano HPLC Column

fully end-capped; pore size: 100Å; pH range: 2.5 to 7.5; temperature limit: 80°C; carbon load: 8%

5µm, 250 x 4.6mm, cat. # 9106575, (ea)

**Figure 2** Peaks 2 and 3 reversed, relative to Ultra C18 on an Ultra Cyano confirmation column.



## Environmental HPLC: Applications, Columns, Reference Materials

(lit. cat. # 59741)  
 Restek HPLC columns support environmental

total HPLC applications with rapid analysis times and effective resolution of target analytes. Sample turn-around can be 50% faster, or more, than with alternative columns. Applications in this 8-page publication include polyaromatic hydrocarbons, carbamates, phenoxyacid herbicides, explosives, and carbonyls. Analytical reference materials and solid phase extraction sample clean-up products also are listed.

## Phenylurea Pesticide Mixture

diflufenuron                    propanil  
 diuron                            siduron  
 fluometuron                    tebuthiuron  
 linuron                            thidiazuron

200µg/mL each in acetonitrile:acetone, 1mL/ampul

Each	5-pk.	10-pk.
32434	32434-510	—
<b>w/data pack</b>		
32434-500	32434-520	32534

## Phenylurea Surrogate Mixture

carbazole                        monuron  
 500µg/mL each in methanol:acetonitrile, 1mL/ampul

Each	5-pk.	10-pk.
32433	32433-510	—
<b>w/data pack</b>		
32433-500	32433-520	32533

## For more info

Restek offers a full line of HPLC columns, guard cartridges, bulk packings, and HPLC accessories. Refer to our 2004 Chromatography Supplies Catalog (lit. cat. # 59854) or visit our website.