

# Application

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## HPLC Separation of Acidic Pesticides, Using a SUPELCOGEL TPR-100 Column

A simple procedure for separating acidic pesticides includes a SUPELCOGEL TPR-100 column. The resin-based HPLC column was used to separate a sample containing nine acidic water soluble pesticides and herbicides within ten minutes. The TPR-100 column can be used in conjunction with sample handling methods such as liquid-liquid extraction and solid phase extraction.

### Key Words:

- acidic pesticides
- HPLC
- SUPELCOGEL TPR-100 column

Acidic herbicides are used extensively to control agricultural and small-water weeds. Concerns about the residues of pesticides in agricultural food products have led scientists to develop many analytical techniques.

Some agencies routinely test samples taken from wells and other sources of drinking water. Most samples are concentrated, using methods such as solid phase extraction and liquid-liquid extraction. Once concentrated, the samples are analyzed using any of a variety of detection, separation, and identification techniques, including HPLC or GC. Some analyses of herbicides and pesticides in fruits, vegetables, and drinking water have been conducted using solid phase extraction and HPLC, with a silica-based HPLC column.

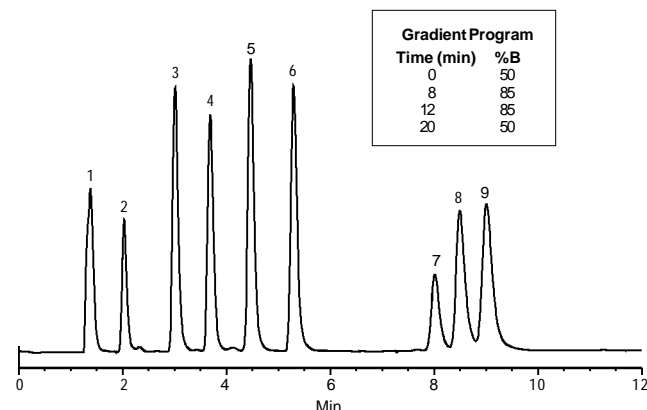
The resin-based SUPELCOGEL™ TPR-100 column is an excellent choice for analysis of pesticides. The TPR-100 column exhibits high efficiency and reduced hydrophobicity, relative to silica-based columns, and is compatible with most mobile phases. It also alters selectivity relative to other reversed phase resins. We manufacture the TPR-100 column using a patented templated polymerization process\*, starting with a 5µm porous silica bead and ending with an exact copy of the silica in resin (the pores of the silica become the skeleton of the resin).

We used a SUPELCOGEL TPR-100 column to separate a water sample containing nine acidic pesticides (Figure A). The TPR-100 column completely separated these analytes, and provided symmetrical peak shapes, in less than ten minutes. Chemical names and structures of these pesticides are shown in Table 1 (see back page).

**Figure A. Separation of Acidic Pesticides with SUPELCOGEL TPR-100 Column**

Column: SUPELCOGEL TPR-100, 15cm x 4.6mm ID, 5µm particles  
Cat. No.: 59154  
Mobile Phase: A = 0.025M potassium phosphate (monobasic), pH 2.3  
B = acetonitrile  
gradient program shown on figure  
Flow Rate: 1mL/min  
Temp.: 45°C  
Det.: UV, 215nm  
Inj.: 10µL containing 100µg/mL of each analyte

1. Tetrachloroterephthalic acid
2. Pichloram
3. Dicamba
4. 2,4-D
5. 2,4,5-T
6. 2,4,5-TP
7. Dinoseb
8. Dacthal
9. Pentachlorophenol



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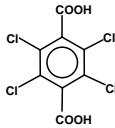
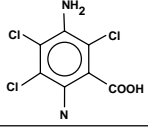
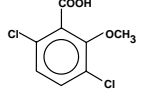
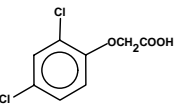
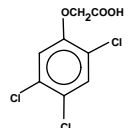
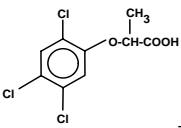
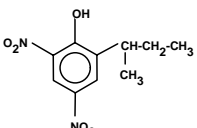
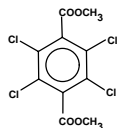
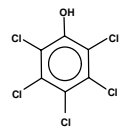
### Ordering Information:

Description	Cat. No.
<b>SUPELCOGEL TPR-100 Column</b> 15cm x 4.6mm ID, 5µm particles	<b>59154</b>

\*US patent no. 4,933,372, Sigma-Aldrich Co.

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**Table 1. Chemical Names of Acidic Pesticides**

Peak Number	Common Name	Chemical Name	Structure
1	Tetrachloroterephthalic acid	Tetrachloroterephthalic acid	 797-0482
2	Pichloram	4-Amino-3,5,6-trichloropicolinic acid	 797-0483
3	Dicamba	2-Methoxy-3,6-dichlorobenzoic acid	 797-0484
4	2,4-D	2,4-Dichlorophenoxy acetic acid	 797-0485
5	2,4,5-T	2,4,5-Trichlorophenoxy acetic acid	 797-0486
6	2,4,5-TP	2-(2,4,5-Trichlorophenoxy) propionic acid	 797-0487
7	Dinoseb	2-(sec-Butyl)-4,6-dinitrophenol	 797-0488
8	Dacthal	Dimethyltetrachloroterephthalate	 797-0489
9	Pentachlorophenol	Pentachlorophenol	 797-0490

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(phone 800-359-3041 or 814-359-3041, FAX 800-359-3044 or  
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