

## Resolving pesticides - analysis and confirmation of organochlorine, nitrogen and phosphorous pesticides by GC and GCMS

**BPX5, BPX50**

### Introduction

BPX50, 50% phenyl polysilphenylene siloxane is a column which demonstrates extremely low bleed and high temperature capabilities. These characteristics make it eminently suitable for trace pesticide analysis as a confirmation column where mass spectrometry is necessary.

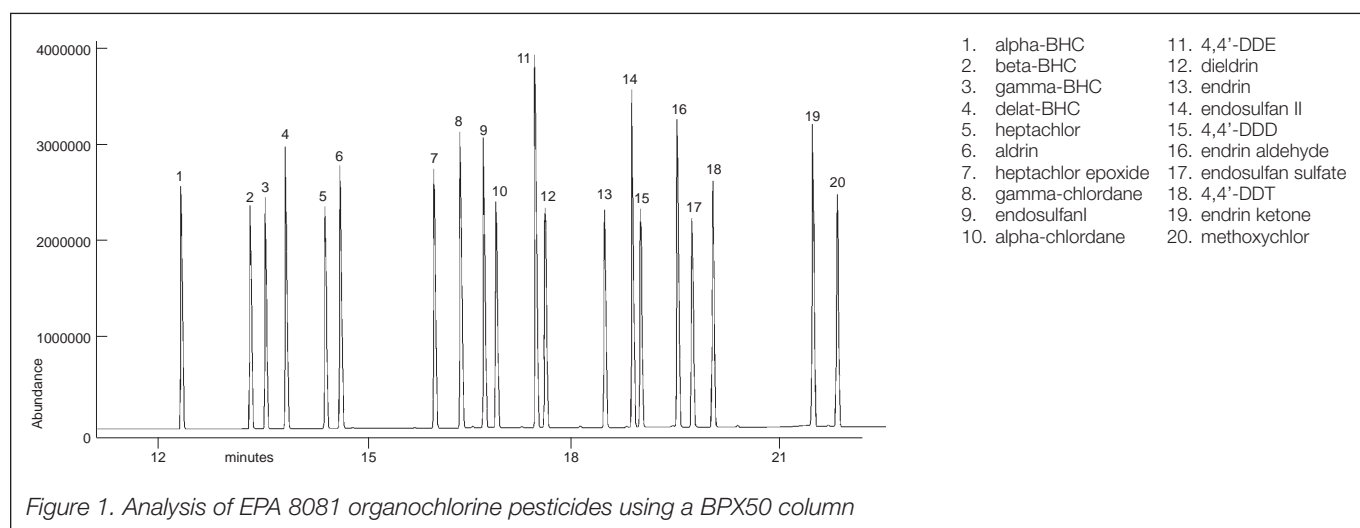
EPA method 8081 includes 20 organochlorine pesticides. Figure 1 demonstrates the unique features of the 50% phenyl polysilphenylene siloxane phase to completely resolve all components within 23 minutes. The United States Environmental Protection Agency (USEPA) has recently released method 8141A which increases the screening list of organophosphorous pesticides from 27 to 47 compounds. With EPA methods being updated to include larger lists of pesticides, there is a growing need to simultaneously analyze, with confirmation, the three main classes of pesticides (Chlorine, Phosphorous and Nitrogen).

A total of 48 pesticides were chromatographed on a 5% phenyl polysilphenylene siloxane (BPX5)

capillary column (Figure 2) which shows excellent selectivity for such a wide variety of environmentally hazardous pesticides. This trace includes pesticides from USEPA methods 507, 608, 614, 619, 622 and 8081. The use of BPX5, however, results in co-elution of five pesticides from this 48 component mixture. Using the single ion monitoring (SIM) mode of analysis, all 48 components can be distinguished, but the complete analysis on just one capillary column is not possible in this case due to the similarities of some of the components.

In choosing a second capillary column for confirmation, one must keep in mind the polarity required to offer some selectivity and the high temperature capabilities with the minimal background bleed required in a MS environment. A 35% phenyl polysilphenylene siloxane (BPX35) column meets this criteria and can resolve all of the 5% phenyl polysilphenylene siloxane co-eluting components except for Propyzamide and Diazinon. An alternative to this is the BPX50 (50% phenyl polysilphenylene siloxane) column which can resolve all of the co-eluting compounds in this mix while maintaining exceptionally low background

| Part number         | 054751                   |                       |                     |
|---------------------|--------------------------|-----------------------|---------------------|
| Phase               | BPX50                    | Final temperature     | 320°C               |
| Column              | 30 m x 0.25 mm x 0.25 µm | Injection             | Split, 280°C        |
| Initial temperature | 50°C, 1 min              | Carrier gas           | He, 35 cm/sec       |
| Rate 1              | 20°C/min to 170°C        | Detector              | MS                  |
| Rate 2              | 8°C/min to 320°C         | Interface/Source/Quad | 320°C, 250°C, 150°C |



bleed (Figure 3). BPX50 is a true 50% phenyl column which offers an alternative to medium polarity phases that meet the high demands of mass spectrometry. At the final temperature of 280°C, the 50% phenyl polysilphenylene siloxane column has a background bleed level of only 500 counts, compared to the 5% phenyl polysilphenylene siloxane column at 400 counts.

These exceptional characteristics make BPX50 eminently suitable for trace pesticide analysis.

### Information and support

Visit [www.trajanscimed.com](http://www.trajanscimed.com) or contact [techsupport@trajanscimed.com](mailto:techsupport@trajanscimed.com)

*Specifications are subject to change without notice.*

| Part number         | 054142 (BPX5), 054751 (BPX50) |                       |                     |
|---------------------|-------------------------------|-----------------------|---------------------|
| Phase               | BPX5, BPX50                   | Detector              | MS                  |
| Column              | 30 m x 0.25 mm x 0.25 µm      | Injector mode         | Splitless, 0.5min   |
| Initial temperature | 50°C, 1 min                   | Carrier gas           | He, 33cm/sec        |
| Rate                | 4°C/min                       | Injection volume      | 0.5µL               |
| Final temperature   | 280°C, 1.5min                 | Interface/Source/Quad | 320°C, 250°C, 150°C |

### Analysis of chlorine, phosphorous and nitrogen based pesticides

