

## Model 5380 PFPD Photomultiplier Tube and Optical Filter Configurations

Application Note 11660899

**Keywords**

Optical Filter

Nitrogen

PFPD

Phosphorus

Photomultiplier Tube

Sulfur

This application note provides a list of photomultiplier tubes (PMTs) and optical filters that can be installed in the Model 5380 Pulsed Flame Photometric Detector (PFPD) to detect different heteroatom species. The PFPD can detect up to 28 different elements. For information on elements not listed here, contact OI Analytical.

The following tables contain guidelines as to the various options available to the operator. The ultimate configuration decision must take into account the particular circumstances involved with a given application, and thus the components used may differ from those in Tables 1 and 2. Figures 1–6 are chromatograms acquired using the PFPD optimized for specific elements.

Table 1. Optimal Configurations for Various Key Elemental Combinations

| <b>Element(s) Detected</b>   | <b>PMT</b>                           | <b>Optical Filter(s)</b>  |
|--|--------------------------------------|---|
| Sulfur   | R1924<br>(Part #284364) <sup>1</sup> | BG-12<br>(Purple, Part #282947) <sup>3</sup>                            |
| Sulfur   | R1925<br>(Part #290049) <sup>2</sup> | BG-12<br>(Purple, Part #282947)   |
| Phosphorus   | R1924<br>(Part #284364)              | GG-495<br>(Yellow, Part #282921)  |
| Phosphorus   | R1925<br>(Part #290049)              | GG-495<br>(Yellow, Part #282921)<br>BG-39<br>(Light Blue, Part #290015) |
| Nitrogen   | R1925<br>(Part #290049)              | RG-695<br>(Black IR, Part #290007)                                      |
| Sulfur &<br>Phosphorus   | R1924<br>(Part #284364)              | UV-34<br>(Clear, Part #310623)  |
| Sulfur &<br>Phosphorus   | R1925<br>(Part #290049)              | UV-34<br>(Clear, Part #310623)<br>BG-39<br>(Light Blue, Part #290015)   |
| Sulfur & Nitrogen  | R1925<br>(Part #290049)              | BG-3<br>(Part #302919)  |
| Phosphorus &<br>Nitrogen   | R1925<br>(Part #290049)              | GG-495<br>(Yellow, Part #282921)  |
| Sulfur, Phosphorus,<br>& Nitrogen  | R1925<br>(Part #290049)              | UV-34<br>(Clear, Part #310623)  |
| <sup>1</sup> R1924 PMT (Part #284364) is supplied with the Model 5380 PFPD.<br><sup>2</sup> R5070 PMT (Part #290106) may be used in place of R1925.<br><sup>3</sup> BG-12 (Purple, Part #282947) is included with the basic Model 5380 PFPD. |                                      |   |

Table 2. Optimal Configurations for Various Other Elements

| <b>Element(s) Detected</b> | <b>PMT(s)</b>  | <b>Optical Filter(s)</b> |
|----------------------------|----------------|--------------------------|
| Aluminum (Al)              | R1924          | GG-495                   |
| Antimony (Sb)              | R1925<br>R1924 | OG-590<br>GG-495         |
| Arsenic (As)               | R1924<br>R1925 | GG-495<br>RG-695         |
| Bismuth (Bi)               | R1924<br>R1925 | GG-495<br>OG-590         |
| Boron (B)                  | R1924          | GG-495                   |
| Bromine (Br)               | R1925          | RG-695                   |
| Carbon (C)                 | R1924          | BG-12                    |
| Chromium (Cr)              | R1924          | GG-495                   |
| Copper (Cu)                | R1925<br>R1924 | OG-590<br>GG-495         |
| Europium (Eu)              | R1925          | OG-590                   |
| Gallium (Ga)               | R1924<br>R1925 | OG-550<br>OG-590         |
| Germanium (Ge)             | R1925          | OG-590                   |
| Indium (In)                | R1924<br>R1925 | RG-495<br>OG-550         |
| Iron (Fe)                  | R1924          | GG-495                   |
| Lead (Pb)                  | R1924          | BG-12                    |
| Manganese (Mn)             | R1924<br>R1924 | IF-403<br>BG-12          |
| Nickel (Ni)                | R1924          | GG-495                   |
| Nitrogen (N)               | R1925<br>R1924 | RG-695<br>GG-495         |
| Rhodium (Rh)               | R1924          | GG-495                   |
| Ruthenium (Ru)             | R1925<br>R1924 | OG-590<br>GG-495         |
| Selenium (Se)              | R1924          | BG-12                    |
| Silicon (Si)               | R1924          | GG-495                   |
| Tellurium (Te)             | R1924<br>R1924 | GG-495<br>BG-12          |
| Tin (Sn)                   | R1924<br>R1924 | BG-12<br>OG-590          |
| Tungsten (W)               | R1924          | GG-495                   |
| Vanadium (V)               | R1925<br>R1925 | OG-590<br>RG-695         |

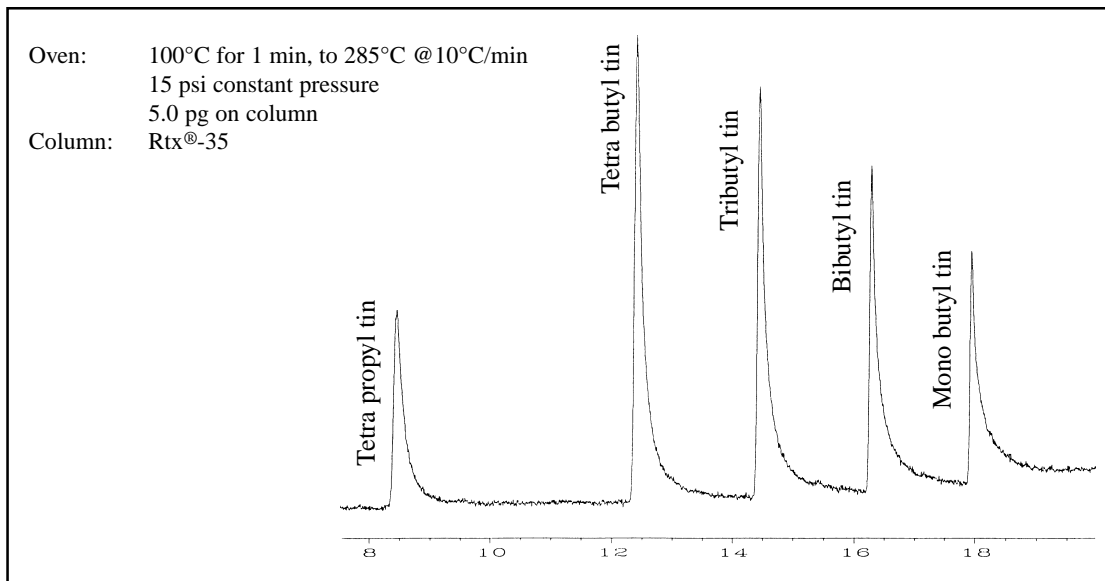


Figure 1. Chromatogram of Organotin Compounds by PFPD (compliments of Restek Corp.)

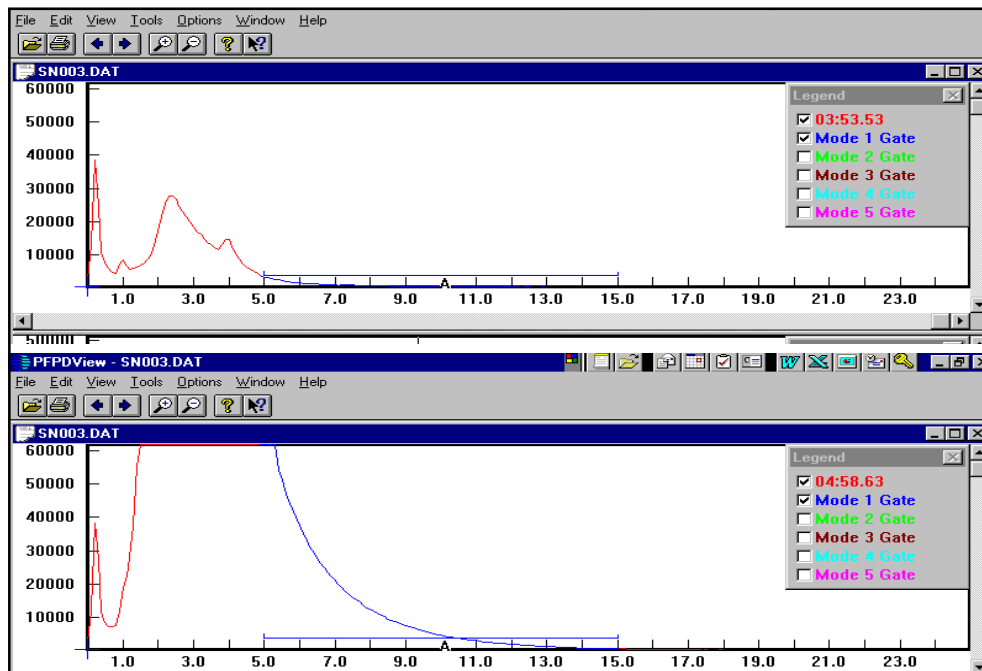


Figure 2. Tin Emission Viewed with PFPDView Software

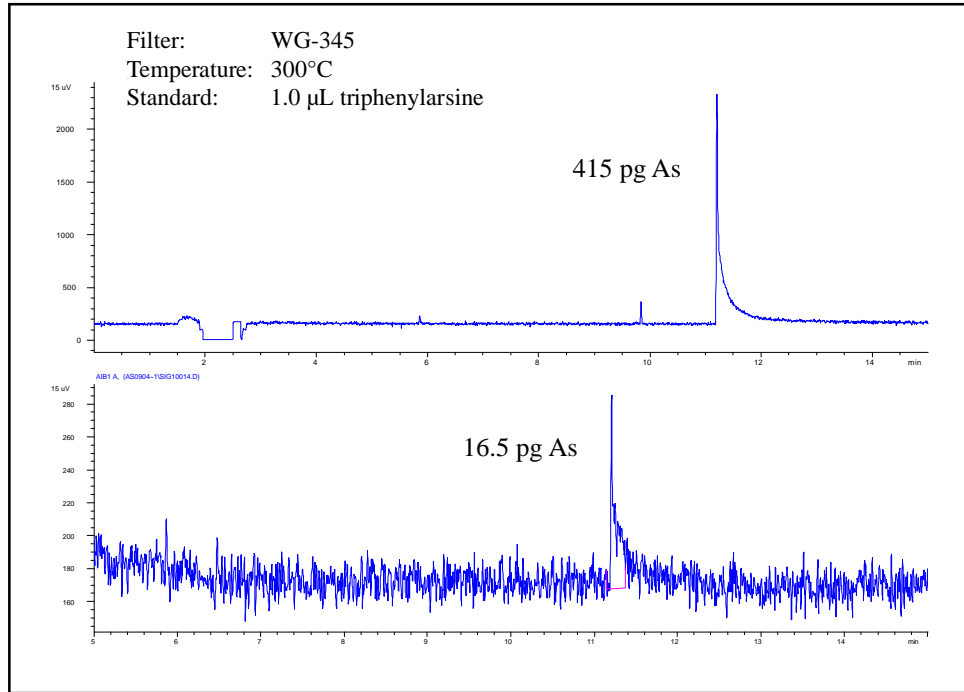


Figure 3. Chromatogram of Arsenic by PFPD

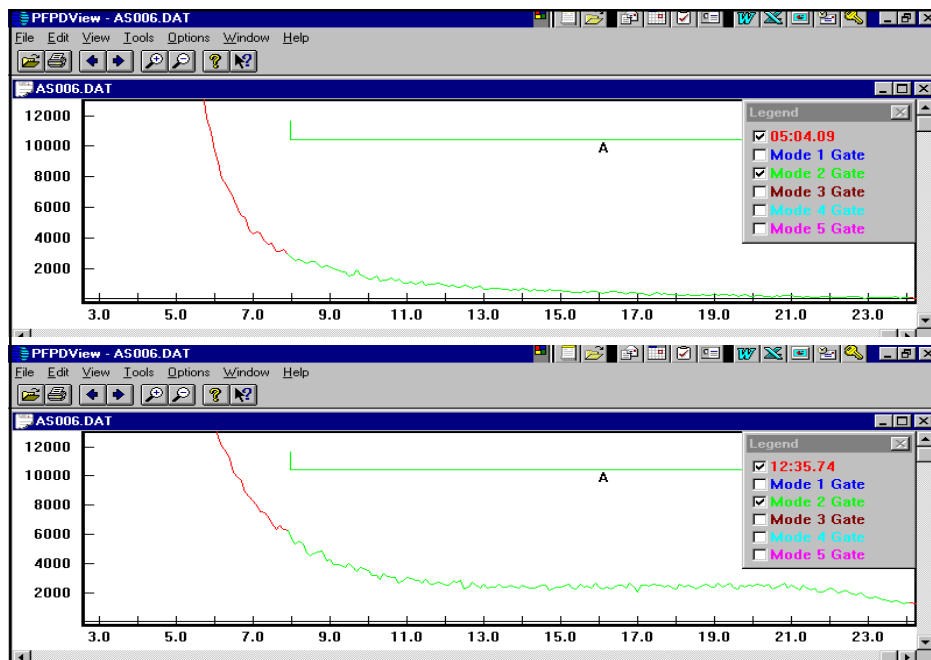


Figure 4. Arsenic Emission Viewed with PFPDView Software

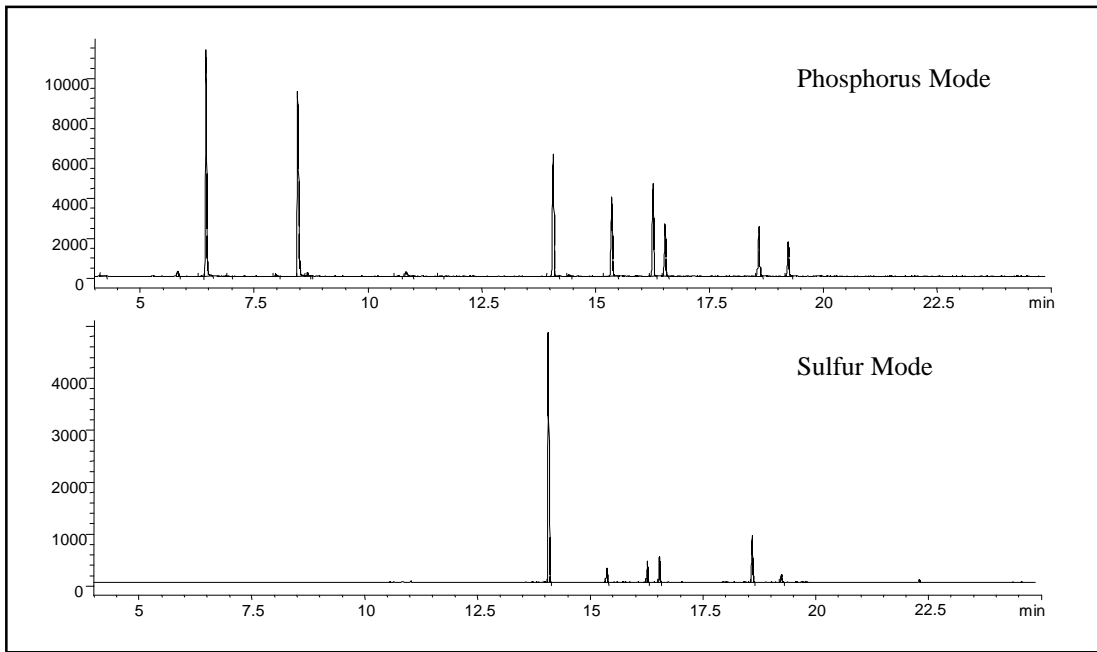


Figure 5. Pesticide Standard, Simultaneous Sulfur and Phosphorus Mode

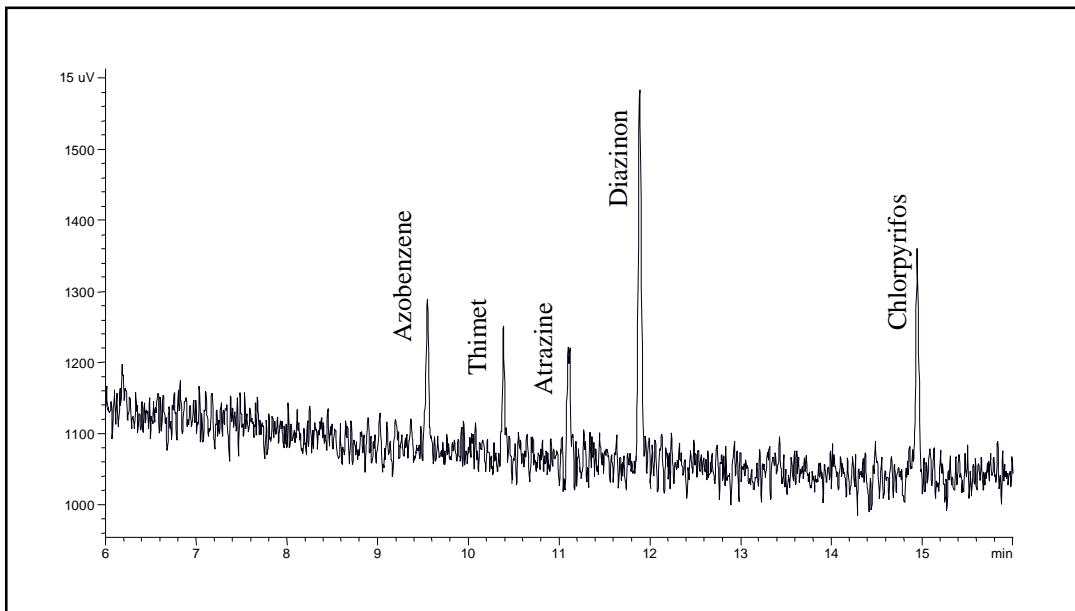


Figure 6. Chromatogram of Pesticide Checkout Standard, Nitrogen Mode (PFPD also responds to P-containing molecules in this configuration)



Rtx is a registered trademark of Restek Corp.



P.O. Box 9010  
College Station, Texas 77842-9010  
Tel: (409) 690-1711 • FAX: (409) 690-0440