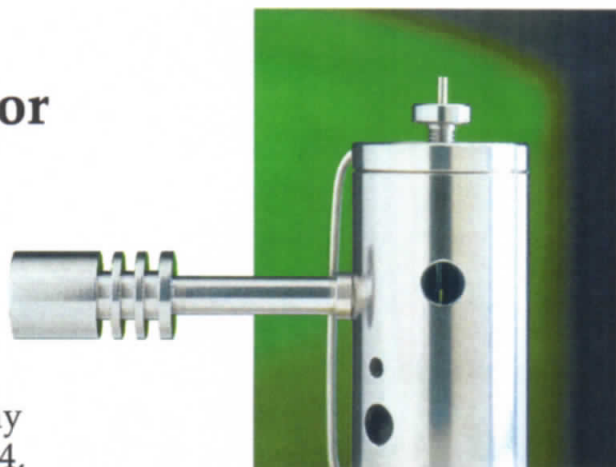


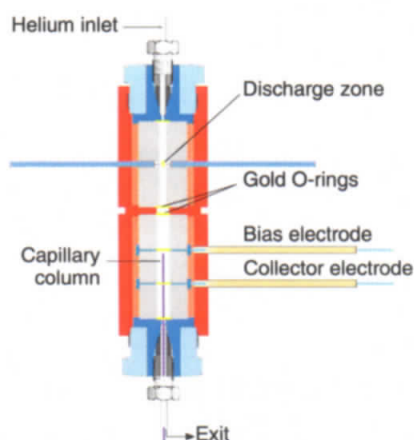
Pulsed Discharge Detector HID • PID

- Non-radioactive
- Sub-picogram sensitivity
- Capillary or packed columns
- Universal retrofit, or plug-and-play installation on Shimadzu 17 and 14, Agilent 6890, and Varian 3800 GC's



Description and Operating Principle

The VICI pulsed discharge detector (PDD), winner of R&D Magazine's prestigious R&D 100 Award, utilizes a stable, low-powered, pulsed DC discharge in helium as an ionization source. Elutants from the column, flowing counter to the flow of helium from the discharge zone, are ionized by photons from the helium discharge. (See the illustration below.) The bias electrode focuses the resulting electrons toward the collector electrode, where they cause changes in the standing current which are quantified as the detector output. The PDD's performance, verified by hundreds of users, is equal to or better than conventional detectors with radioactive sources.



Mode Selection

Helium Photoionization Mode

In the helium photoionization mode, the PDD is a universal, non-destructive, high sensitivity detector. The close-to-true-mass response to both inorganic and organic compounds is linear over a wide range. Response to fixed gases is positive (standing current increases), with an MDQ in the low ppb range. The PDD in this mode is an excellent replacement for flame ionization detectors in petrochemical or refinery environments, where the flame and the use of hydrogen can be problematic.

Selective Photoionization Mode

When the helium discharge gas is doped with a suitable noble gas, such as argon, krypton, or xenon (depending on the desired ionization potential cutoff point), the PDD can function as a specific photoionization detector for selective determination of aliphatics, aromatics, amines, and other species. Any problems associated with the presence of a window between the photon source and the ionization chamber are eliminated. In most applications involving current commercial PIDs, analyte condensation and decomposition on the window attenuate the lamp energy, necessitating frequent cleaning and recalibration.

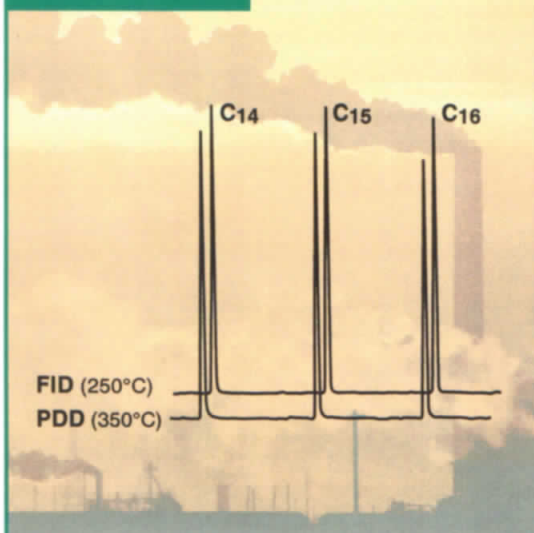
The following patent numbers apply to this product:

| | | |
|-----------|-----------|-----------|
| 5,153,519 | 5,317,271 | 5,394,090 |
| 5,394,091 | 5,541,519 | 5,532,599 |
| 5,528,150 | 5,594,346 | 5,394,092 |

Sample Chromatograms

Hydrocarbon analysis (C₁₄-C₁₆)

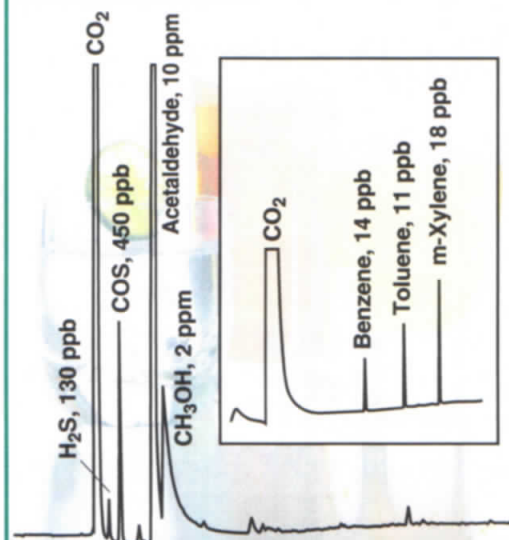
Dow Chemical, Canada
Western Canada Operations,
Analytical Sciences
Jim Luong



A flame ionization detector (FID) is the typical choice for this analysis. The upper chromatogram shows an FID run of C₁₄, C₁₅, and C₁₆; the lower shows the same run on a PDD under identical column conditions. The PDD offers comparable performance without the use of flame or combustible gases. And since the PDD's response is universal, it detects permanent gases, aldehydes, and inorganic compounds like H₂S and COS, which cannot be detected by the FID.

Impurities in food grade CO₂

Valco Instruments Co. Inc.
J. Madabushi, Ph.D.



Food and beverage grade CO₂ is routinely analyzed for trace level impurities which could impart an undesirable flavor to the product or pose a health hazard. Used in the argon photoionization mode, the PDD has little response to the CO₂ matrix peak but excellent sensitivity to all peaks of interest. This analysis previously required sample preconcentration and multiple detectors to achieve similar results.

Ordering Information

Complete Detector Kit

Includes a detector cell, pulser, controller, electrometer, and helium purifier

| | 110 VAC | 230 VAC |
|------------------------------|----------|--------------|
| Plug-in detector for HP 6890 | D-3-I-HP | D-3-I-HP-220 |
| for other GCs | D-4-I | D-4-I-220 |
| (Specify make and model) | | |

Detector only

Includes a detector cell, pulser, and helium purifier. Uses the existing GC FID electrometer and heating circuits

| | D-4-I-R | D-4-I-R-220 |
|--------------------------|---------|-------------|
| Detector for most GCs | | |
| (Specify make and model) | | |

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