In constant innovation, LDetek can now offer the PlasmaDetek series and MultiDetek2 with Argon, Helium or Nitrogen as carrier gas to achieve ppm/ppb detection.
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**Environments**

- Environment
- Hydrocarbons Processing
- Industrial Gas
- Petrochemical
- Agriculture
- Electronic Gases & Semiconductor
- Energy
- Natural Gas
- Hydrocarbons Processing
- Food and Beverage
- Pharmaceutical and Medicine
- Health and Safety
This microprocessor based plasma emission detector system gives all the tools to the GC integrator, manufacturer and user to integrate a plug and play detection system. With its customizable configuration capability, a detector has never been so intelligent.

**IN A GLANCE:**

- Argon or helium carrier gas
- No dead volume design
- All in one detector by replacing existing technologies commonly used
- Selective and non-selective configuration
- Analog or digital interface
- Wide range of applications
- Easy to interface with any GC and analyzer design
- PPB to % detection
- Very stable signal
- Maintenance free
- Fast installation and tune up
- Configuration software
- Possibility of customizable protocol to control the device
- Detect organic and inorganic compounds, permanent gases and noble gases (including Ne)
HEATED CAPABLE MICRO PLASMA EMISSION DETECTOR WITH INTERCHANGEABLE OPTICS

Flexible plasma emission detector for gas chromatograph. The ideal gas detector for ppb/ppm trace impurities in different gas matrix. The modular philosophy of this detector makes it suitable for lab operations as well as industrial applications.

FEATURES:

- Stand alone detector for any GC
- Heating up to 200 Celsius
- Up to 4 removable/changeable optical filters for a more flexible detector
- Changeable plasma cell
- Possibility to connect a spectrometer fiber optic direct on the cell for specific lab or research project
- Compatible with the PlasmaDetek 2 controller which makes it compatible with any previous installation
- Compatible with Clarity from DataApex
- Ideal for ppb/ppm trace impurities
- Replace ECD-FID-TCD-DID all in one detector
- Compatible with Helium, Argon, Nitrogen as carrier gas
- Selective, sensitive and generic configurable
- Quick switchable carrier gas type
FLEXIBLE COMPACT GAS CHROMATOGRAPH
FOR INDUSTRIAL AND LAB APPLICATIONS

With its plug and play philosophy and offering more features than ever, LDetek pushes further the possibilities with its new chromatograph system. It provides an attractive and cost effective solution for the industrial and laboratory market.

Based on the LDetek high performance detection technology, this stand-alone Gas Chromatograph is a flexible and customized platform providing the best solution for any type of gas analysis.

FEATURES & DESIGN:
- One chassis configuration (6U Rackmount)
- Multichannels
- Multimethods
- Multidetectors
- Up to 6 isothermal or 3 programmable oven combination
- Up to 5 high purity proportional diaphragm valves (carrier-sample)
- Easy maintenance with its slide out design and front opening door
- ppt, ppb, ppm and % gas analysis
- Built in PC with 8.4” touch screen LCD & user-friendly interface
- Up to 10 high performance diaphragm valves
- Ethernet connectivity for remote control
- Integrated compact purifier with real end of life monitoring
- Serial/Profibus/Modbus communication protocols
- Fast parallel chromatography
- Multi heated zones to avoid cold points
- Purged & real time monitored zones for hazardous gases
- Multi sample injection techniques
Looking for a **SAFE, SENSITIVE, LOW OPERATION COST** and **MAINTENANCE FREE** system?

The patent pending **PlasmaDetek-E** is the solution

**SAFE**

No fuel (H₂) and no related safety accessories

**SENSITIVE**

< 1 ppb lowest detection possible

**LOW OPERATING COST**

Only N₂ carrier gas supply

**MAINTENANCE FREE**

No periodic detector cleaning
OF LIGHT HYDROCARBON MEASUREMENT

NEW ERA

Looking for a SAFE, SENSITIVE, LOW OPERATION COST and MAINTENANCE FREE system?

The patent pending PlasmaDetek-E is the solution!

- No fuel (H2) and no related safety accessories
- No periodic detector cleaning
- Only N2 carrier gas supply
- < 1 ppb lowest detection possible

MULTIDETEK 2 WITH PLASMADETEK-E

FID BASED GC

H2 FUEL GENERATOR

OPTIONAL TRAP NETWORK

H2 SENSOR

GAS PURIFIER

FID-GC

COMPRESSOR

AIR GENERATOR

OPTIONAL TRAP NETWORK

INSTALLATION COST* COMPARISON

<table>
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<tr>
<th>Parts</th>
<th>MultiDetek 2 with PlasmaDetek-E</th>
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<tr>
<td>H2 generator</td>
<td>N/A</td>
<td>$7200</td>
</tr>
<tr>
<td>Zero air generator</td>
<td>N/A</td>
<td>$2125</td>
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<tr>
<td>Air compressor</td>
<td>N/A</td>
<td>$1200</td>
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<td>N/A</td>
<td>$1500</td>
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<tr>
<td>2 year maintenance cost</td>
<td>$2000</td>
<td>$5000</td>
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<tr>
<td><strong>Total cost</strong></td>
<td><strong>$2000</strong></td>
<td><strong>$17,025</strong></td>
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* costs are approximate and may vary for each system

Please consult Application Note LD14-01 on LDetek web site for more technical details.
LDetek is proud to publish its fourth ChromatoMag edition. The goal of this publication is to demonstrate some of the capabilities using the PlasmaDetek series stand alone gas detector system and the compact Industrial & Lab GC MultiDetek2 series.

This magazine shows a variety of chromatograms that have been run in different conditions:

- The chromatograms show analysis of numerous impurities at different concentration level to see the sensitivity level of the PlasmaDetek.

- **The use of Argon, Helium or Nitrogen as carrier gas has been demonstrated to show the extended possibilities of the PlasmaDetek. With the worldwide Helium shortage and continuous Helium price increasing, the use of Argon and Nitrogen as carrier gas is more and more attractive.**

- The components have been analyzed using different types of columns; Capillary, Micro Packed, Packed at different flows and different temperatures. It demonstrates the capacity of the plasma to work easily with low and high carrier flow.

- Some of the analyses have been performed with different matrix gases to show the advantages of using the PlasmaDetek in its selective mode. The selectivity of the detectors can be adjusted depending on the application for being sensitive to desired impurities and block the matrix gas. It simplifies the chromatography configuration and can reduce the analysis time.

- On every chromatogram, the system conditions have been described. It is a good tool for developing method using the PlasmaDetek technology.

If you have an application for which you would like to have a quotation for the PlasmaDetek or the MultiDetek, at the end of the magazine, you will find the PlasmaDetek and the MultiDetek guidelines. Feel free to fill the form with the details about your application and send it back to info@ldetek.com. A LDetek representative will get back to you with a detailed quotation.

For more information, please contact LDetek at info@ldetek.com or visit our LDetek web site at www.ldetek.com.
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<td>18-19-77-85-112</td>
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<td>6-7-9-10-23</td>
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CHROMATOGRAM #1

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 10 meters Plot Q - Bond 0.32mmID
- Carrier flow rate: 3sccm
- Sampling loop volume: 60uL
- Column temperature: 80 Celsius isothermal
- Impurity concentration: Acetaldehyde: 132 ppb

CHROMATOGRAM #2

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q - Bond 0.53mmID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 100 Celsius isothermal
- Impurity concentration: Acetaldehyde: 132 ppb

CHROMATOGRAM #3

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 10 meters Plot Q - Bond 0.32mmID
- Carrier flow rate: 3sccm
- Sampling loop volume: 60uL
- Column temperature: 70 Celsius isothermal
- Impurity concentration: Formaldehyde: 90 ppb

CHROMATOGRAM #4

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q - Bond 0.53mmID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 100 Celsius isothermal
- Impurity concentration: Formaldehyde: 8.1 ppb

CHROMATOGRAM #5

- Application: Analysis of low ppm/ppb acids & sulfurs & N2O in air
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2 (PED)
- Carrier gas: Helium
- Columns: Stabilwax-DA, MXT-1, Shin Carbon
- Sample gas composition: 680ppb Acetic acid, 240ppb Formic acid, 850ppb H2S, 820ppb COS, 805ppb N2O, Balance dry air
- Application: Analysis of low ppm/ppb acids & sulfurs & N2O in Air
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2 (PED)
- Carrier gas: Helium
- Columns: Stabilwax-DA, MXT-1, Shin Carbon

CHROMATOGRAM #6

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column types: 1x30 meter 0.53mmID Plot Molecular Sieve 5A, 1x30 meter 0.53mm ID Plot Alumina Bond/Na2SO4
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 60 Celsius isothermal
- Column temperatures: 60 Celsius isothermal, 40 Celsius until minute 10, and then increase up to 150 Celsius 20 Celsius/minute
- Impurity concentrations: H2: 8.1 ppm, O2: 9.7 ppm, N2: 14.0 ppm, CH4: 9.4 ppm, CO: 8.1 ppm, C2H6: 11.2 ppm, C2H4: 7.9 ppm, C3H8: 9.1 ppm, C3H6: 9.0 ppm, C2H2: 7.8 ppm, C4H8: 10.5 ppm
**CHROMATOGRAM #7**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 10 meters Plot Q-Bond 0.32mmID
- Carrier flow rate: 3scm
- Sampling loop volume: 60uL
- Column temperatures: 60 Celsius until min 3, then 130 Celsius
- Impurity concentrations:
  - CH₄: 10 ppm
  - C₂H₂: 10 ppm
  - C₂H₆: 10 ppm

**CHROMATOGRAM #8**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate: 4scm
- Sampling loop volume: 60uL
- Column temperatures: 60 Celsius isothermal until minute 3, and then 140 Celsius until minute 10.
- Impurity concentrations:
  - CH₄: 4.1 ppm
  - C₂H₂: 3.1 ppm
  - C₂H₆: 6.1 ppm

**CHROMATOGRAM #9**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon or Nitrogen can be used as well)
- Column temperature: 200 Celsius
- Impurity concentrations:
  - C₂H₂: 4.0 ppm
  - C₂H₆: 6.6 ppm

**CHROMATOGRAM #10**
- Detector: PlasmaDetek-E (PED)
- Instrument: MultiDetek micro GC series
- Configuration: Single injection at isothermal temperature
- Column: 2 Meters Packed ShinCarbon
- Column temperature: 150 Celsius
- Impurity concentrations:
  - CH₄: 9.56 ppm
  - C₂H₂: 10.5 ppm
  - C₂H₄: 9.96 ppm

**CHROMATOGRAM #11**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon or Nitrogen can be used as well)
- Column type: 30 meters Plot Alumina BOND/Na₂SO₄
- Carrier flow rate: 4scm
- Sampling loop volume: 60uL
- Column temperature: 80 Celsius isothermal
- Impurity concentration: NH₃: 11.4 ppm

**CHROMATOGRAM #12**
- Carrier Gas: Helium (Argon or Nitrogen can be used as well)
- Column type: 8 feet, 1/8'' Packed Stainless Steel ArgoTek (LDetek's column)
- Carrier flow rate: 20sccm
- Sampling loop volume: 50ul
- Column temperature: 45 Celsius isothermal
- Impurity concentration: Ar: 0.9 ppm

**CHROMATOGRAM #13**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate: 4scm
- Sampling loop volume: 60uL
- Column temperature: 140 Celsius isothermal
- Impurity concentration: NH₃: 11.4 ppm

**CHROMATOGRAM #14**
- Trace Ar in Oxygen matrix
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Column type: 8 feet, 1/8'' Packed Stainless Steel ArgoTek (LDetek's column)
- Carrier flow rate: 20sccm
- Sampling loop volume: 50ul
- Column temperature: 45 Celsius isothermal
- Impurity concentration: Ar: 0.9 ppm

**CHROMATOGRAM #15**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration: Ar: 225 ppb
**CHROMATOGRAM #16**

- Instrument: Micro GC MultiDetek series
- Column: ArgoTek (LDetek's column)
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration: Argon: 179 ppb

**CHROMATOGRAM #17**

- Instrument: Micro GC MultiDetek series
- Column: ArgoTek (LDetek's column)
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration: Argon: 201 ppb
  - Nitrogen: 126 ppb

**CHROMATOGRAM #18**

- Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Column type: 12 feet, 1/8” Packed Stainless Steel HSR-Etek (LDetek's column)
- Carrier flow rate: 20 sccm
- Sampling loop volume: 250 uL
- Column temperature: 45 Celsius isothermal
- Impurity concentrations:
  - Neon: 4.1 ppm
  - H₂: 5.0 ppm
  - Ar: 0.9 ppm
  - Kr: 4.2 ppm
  - N₂: 0.4 ppm

**CHROMATOGRAM #19**

- Instrument: Micro GC MultiDetek series
- Column: ArgoTek (LDetek's column)
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentrations:
  - Neon: 3.62 ppm
  - Argon: 2.74 ppm
  - Hydrogen: 5.27 ppm
  - Oxygen: 5.76 ppm
  - Carbon monoxide: 5.15 ppm
  - Carbon dioxide: 5.12 ppm

**CHROMATOGRAM #20**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 10 meters Plot Q-Bond 0.32mmID
- Carrier flow rate: 35 sccm
- Sampling loop volume: 80 uL
- Column temperature: 50 Celsius isothermal
- Impurity concentration: AsH₃: 6.2 ppm

**CHROMATOGRAM #21**

- Instrument: Micro GC MultiDetek series
- Column: ArgoTek (LDetek's column)
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentrations:
  - Neon: 3.53 ppm
  - Argon: 2.73 ppm
  - Oxygen: 5.73 ppm
  - Methane: 5.17 ppm
  - Non methane hydrocarbons: 5.62 ppm

**CHROMATOGRAM #22**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q-Bond 0.53 mmID
- Carrier flow rate: 45 sccm
- Sampling loop volume: 60 uL
- Column temperature: 55 Celsius isothermal
- Impurity concentrations:
  - Argon: 6.2 ppm
  - Nitrogen: 5.41 ppm
  - Oxygen: 5.73 ppm
  - Methane: 5.15 ppm
  - Non methane hydrocarbons: 5.62 ppm
CHROMATOGRAM #23

- Application: Analysis of trace hydrocarbons, CO2, N2O in high purity Oxygen.
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon can be used as well
- Column type: 10 meters Q-Bond 0.32mm ID
- Carrier flow rate: 3sccm
- Sampling loop volume: 60uL
- Column temperature: 30 Celsius isothermal
- Impurity concentrations: CH4: 9.0 ppm, CO2: 3.1 ppm

CHROMATOGRAM #24

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot Q-Bond 0.32mm ID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 30 Celsius isothermal
- Impurity concentrations: CH4: 9.0 ppm, CO2: 3.1 ppm

CHROMATOGRAM #25

- Application: Analysis of trace hydrocarbons, CO2, N2O in high purity Oxygen.
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon
- Impurity concentrations: Hydrogen: 9.8 ppm, Oxygen: 7.1 ppm, Methane: 7.2 ppm, Carbon dioxide: 7.8 ppm, Carbon monoxide: 7.5 ppm

CHROMATOGRAM #26

- Application: Analysis of trace hydrocarbons, CO2, N2O in high purity Oxygen.
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q-Bond 0.32mm ID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 30 Celsius isothermal
- Impurity concentrations: CH4: 9.0 ppm, CO2: 3.1 ppm

CHROMATOGRAM #27

- Application: Analysis of trace hydrocarbons, CO2, N2O in high purity Oxygen.
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 2 X 10', 1/8'' Packed Stainless Steel Hayesep D
- Carrier flow rate: 30sccm
- Sampling loop volume: 1mL
- Column temperature: 50 Celsius isothermal
- Impurity concentrations: CH4: 8.1 ppm, CO2: 50.7 ppm, N2O: 10.0 ppm

CHROMATOGRAM #28

- Application: Analysis of trace hydrocarbons, CO2, N2O in high purity Oxygen.
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q-Bond 0.32mm ID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 30 Celsius isothermal
- Impurity concentrations: CH4: 9.0 ppm, CO2: 3.1 ppm

CHROMATOGRAM #29

- Application: Analysis of trace hydrocarbons, CO2, N2O in high purity Oxygen.
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q-Bond 0.32mm ID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 30 Celsius isothermal
- Impurity concentrations: CH4: 9.0 ppm, CO2: 3.1 ppm

CHROMATOGRAM #30

- Application: Analysis of trace hydrocarbons, CO2, N2O in high purity Oxygen.
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q-Bond 0.32mm ID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 30 Celsius isothermal
- Impurity concentrations: CH4: 9.0 ppm, CO2: 3.1 ppm

CHROMATOGRAM #31

- Application: Analysis of trace hydrocarbons, CO2, N2O in high purity Oxygen.
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q-Bond 0.32mm ID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 30 Celsius isothermal
- Impurity concentrations: CH4: 9.0 ppm, CO2: 3.1 ppm

CHROMATOGRAM #32

- Application: Analysis of trace hydrocarbons, CO2, N2O in high purity Oxygen.
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q-Bond 0.32mm ID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 30 Celsius isothermal
- Impurity concentrations: CH4: 9.0 ppm, CO2: 3.1 ppm

Where innovation leads to success
CHROMATOGRAM #33

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Impurity concentrations:
  - Nitrogen: 0.9ppm
  - Carbon monoxide: 0.7ppm

CHROMATOGRAM #34

- Application: Analysis of low ppb H2-NMHC-CH4-N2-CO2-CO in electronic grade gas Oxygen
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek-E (PED)
- Carrier gas: Helium
- Column: Packed
- Sample gas composition:
  - H2: 7.7ppb
  - NMHC: 1.5ppb
  - CH4: 8.5ppb
  - N2: 7.2ppb
  - CO2: 4.5ppb

CHROMATOGRAM #35

- Application: Analysis of low ppb H2-NMHC-CH4-N2-CO2-CO in electronic grade Oxygen
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier gas: Argon
- Impurity concentrations:
  - Nitrogen: 0.9ppm
  - Methane: 0.4ppm
  - Carbon monoxide: 0.7ppm

CHROMATOGRAM #36

- Application: Analysis of low ppb H2-NMHC-CH4-N2-CO2-CO in electronic grade gas Oxygen
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek-E (PED)
- Carrier gas: Helium
- Column: Packed
- Sample gas composition:
  - H2: 38.2ppb
  - NMHC: 25.2ppb
  - CH4: 36.8ppb
  - N2: 36.9ppb
  - CO2: 26.4ppb

CHROMATOGRAM #37

- Application: Analysis of low ppb H2-NMHC-CH4-N2-CO2-CO in electronic grade gas Oxygen
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier gas: Argon
- Impurity concentrations:
  - Nitrogen: 10.4ppm
  - Methane: 10.4ppm
  - Carbon monoxide: 10.7ppm

CHROMATOGRAM #38

- Application: Analysis of low ppb H2-NMHC-CH4-N2-CO2-CO in electronic grade gas Oxygen
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek-E (PED)
- Carrier gas: Helium
- Column: Packed
- Sample gas composition:
  - H2: 111.9ppb
  - NMHC: 129.2ppb
  - CH4: 87.6ppb
  - N2: 124.3ppb
  - CO2: 84.4ppb

CHROMATOGRAM #39

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Column type: 30 meters Plot Molecular Sieve 0.53mmID
- Carrier flow rate: 3sccm
- Sampling loop volume: 160uL
- Column temperature: 70 Celsius isothermal
- Impurity concentrations:
  - Hydrogen: 0.1ppm
  - Oxygen: 1.6ppm
  - Nitrogen: 1.4ppm
  - Methane: 1.4ppm
  - Carbon monoxide: 1.7ppm

CHROMATOGRAM #40

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Impurity concentrations:
  - Nitrogen: 1.1ppm
  - Methane: 1.2ppm
  - Carbon monoxide: 1.7ppm
**CHROMATOGRAM #41**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon

**Impurity concentrations**:
- Methane: 5.3ppm
- Carbon dioxide: 4.12ppm
- Hydrogen: 4.73ppm
- Nitrogen: 5.96ppm
- Non Methane hydrocarbons: 5.38ppm
- Carbon monoxide: 4.92ppm

**CHROMATOGRAM #42**

- Application: Sulfur hexafluoride purity (SF6)
- Instrument: MultiDetek2 GC
- Detector: PlasmaDetek2
- Carrier gas: Argon or Helium

**Impurity concentrations**:
- O2: 1495ppm
- N2: 1448ppm
- CO: 199ppm

in SF6

**CHROMATOGRAM #43**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 1 meter micro packed 1/16”ID Rt-XLSulfurs
- Carrier flow rate: 8sccm
- Sampling loop volume: 200uL
- Column temperature: 60 Celsius isothermal
- Impurity concentrations:
  - H2S: 9.8 ppm
  - COS: 9.4 ppm

**CHROMATOGRAM #44**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX-QBond 0.53mmID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 100 Celsius isothermal
- Impurity concentrations:
  - H2S: 6.4 ppm
  - COS: 5.1 ppm

**CHROMATOGRAM #45**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 10 meters Plot Q-Bond 0.32mmID
- Carrier flow rate: 3sccm
- Sampling loop volume: 60uL
- Column temperature: 30 Celsius isothermal
- Impurity concentrations:
  - H2S: 6.4 ppm
  - COS: 5.1 ppm

**CHROMATOGRAM #46**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters GasPro 0.32mmID
- Carrier flow rate: 3sccm
- Sampling loop volume: 140uL
- Impurity concentrations:
  - H2S: 1.1ppm
  - COS: 0.8ppm

**CHROMATOGRAM #47**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 12 feet 1/8” Packed Stainless Steel HSR-Etek (LDetek’s column)
- Carrier flow rate: 20sccm
- Sampling loop volume: 250uL
- Column temperature: 45 Celsius isothermal
- Impurity concentrations:
  - Kr: 9.8 ppm
  - N2: 10.9 ppm
**CHROMATOGRAM #48**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 2 X 10', 1/8'' Packed Stainless Steel Hayesep D
- Carrier flow rate: 30sccm
- Sampling loop volume: 1mL
- Column temperature: 50 Celsius isothermal
- Impurity concentrations:
  - CH4: 1.8 ppm
  - CO2: 330 ppm
  - N2O: 0.3 ppm

**CHROMATOGRAM #49**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon
- Impurity concentrations:
  - Hydrogen: 2.2ppm
  - Oxygen: 2.1ppm
  - Carbon monoxide: 1.6ppm
  - Methane: 1.1ppm

**CHROMATOGRAM #48**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 2 x 8 feet, 1/8'' Packed Stainless Steel Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 1mL
- Column temperature: 60 Celsius isothermal
- Impurity concentrations:
  - CH4: 1.8 ppm
  - CO2: 330 ppm
  - N2O: 0.3 ppm

**CHROMATOGRAM #49**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon
- Impurity concentrations:
  - Hydrogen: 2.2ppm
  - Oxygen: 2.1ppm
  - Carbon monoxide: 1.6ppm
  - Methane: 1.1ppm

**CHROMATOGRAM #52**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Column type: 2 x 8 feet, 1/8'' Packed Stainless Steel Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 1mL
- Column temperature: 60 Celsius isothermal
- Impurity concentrations:
  - CH4: 1.8 ppm
  - CO2: 330 ppm
  - N2O: 0.3 ppm

**CHROMATOGRAM #53**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Column type: Packed Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 500uL
- Column temperature: 60 Celsius isothermal
- Impurity concentration:
  - Nitrogen: 212ppm

**CHROMATOGRAM #54**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meter 0.53mmID Plot Alumina BOND/Na2SO4
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 40 Celsius isothermal
- Impurity concentration:
  - N2O: 5.4 ppm

**CHROMATOGRAM #55**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Column type: Packed Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 500uL
- Column temperature: 60 Celsius isothermal
- Impurity concentration:
  - N2O: 5.4 ppm

**CHROMATOGRAM #56**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon (Helium can be used as well)
- Column type: 12 feet, 1/8'' Packed Stainless Steel Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 500uL
- Column temperature: 60 Celsius isothermal
- Impurity concentration:
  - N2: 5.0 ppm

**CHROMATOGRAM #57**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 2 x 8 feet, 1/8'' Packed Stainless Steel Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 160uL
- Column temperature: 70 Celsius isothermal
- Impurity concentrations:
  - O2: 5.7 ppm
  - N2: 12.0 ppm

**CHROMATOGRAM #58**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Impurity concentrations:
  - Hydrogen: 0.9ppm
  - Oxygen: 0.9ppm
  - Nitrogen: 0.95ppm
  - Methane: 1.1ppm
**CHROMATOGRAM #59**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 10 meters Plot Q-Bond 0.32mmOD
- Carrier flow rate: 3sccm
- Sampling loop volume: 60uL
- Column temperature: 55 Celsius isothermal
- Impurity concentration: PH3: 7.5 ppm

**CHROMATOGRAM #60**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meter 0.33mmID Plot Alumina BOND/Na2SO4
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 40 Celsius isothermal
- Impurity concentration: PH3: 7.5 ppm

**CHROMATOGRAM #61**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column: Packed Hayesep Q 10'
- Column temperature: 45 Celsius
- Carrier gas flow rate: 20sccm
- Sample gas: 8ppm CF4 in balance Helium

**CHROMATOGRAM #62**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon
- Columns: Q Bond pre column combined with Mol Sieve second column
- Sample gas:
  - H2: 8.1ppm
  - O2: 9.1ppm
  - N2: 10.5ppm
  - CH4: 9.6ppm
  - CO: 9.6ppm
  - CO2: 5.2ppm
  - In balance Propylene

**CHROMATOGRAM #63**
- Instrument: MultiDetak2 GC
- Detector: PlasmaDetek2
- Carrier gas: Helium
- Columns: Packed Hayesep Q 10'
- Column temperature: 45 Celsius
- Carrier gas flow rate: 20sccm
- Sample gas: 8ppm CF4 in balance Helium

**CHROMATOGRAM #64**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 10 meters Plot Q-Bond 0.32mmID
- Carrier flow rate: 3sccm
- Sampling loop volume: 60uL
- Column temperature: 40 Celsius isothermal
- Impurity concentration: H2O: 411 ppb

**CHROMATOGRAM #65**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q-Bond 0.32mmID
- Carrier flow: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 140 Celsius isothermal
- Impurity concentration: H2O: 211 ppb

**CHROMATOGRAM #66**
- Application: Trace impurities
- H2/O2/N2/CH4/CO/CO2 in Refinery/Petrochemical gases
- Instrument: MultiDetek2 GC
- Detector: PlasmaDetek2
- Carrier gas: Helium or Argon
- Columns: Q Bond pre column combined with Nitro Sieve second column
- Sample gas:
  - H2: 8.1 ppm
  - O2: 9.1 ppm
  - N2: 10.5 ppm
  - CH4: 9.6 ppm
  - CO: 9.6 ppm
  - CO2: 5.2 ppm
  - In balance Propane
**CHROMATOGRAM #67**

- **Instrument**: MultiDetek2 GC
- **Detector**: PlasmaDetek2
- **Carrier Gas**: Argon
- **Impurities**:
  - H₂: 6.3ppm
  - O₂: 6.3ppm
  - N₂: 6.4ppm
  - CH₄: 6.9ppm
  - CO: 6.5ppm
  - CO₂: 5.1ppm
- **NMHC**: 4.1ppm
- **Sample**: Argon

**CHROMATOGRAM #68**

- **Application**: Trace hydrocarbons in Oxygen
- **Instrument**: MultiDetek2 compact GC
- **Detector**: PlasmaDetekE
- **Carrier Gas**: Nitrogen
- **Impurities**:
  - CH₄: 75ppm
  - NMHC: 125ppm
- **Sample**: Oxygen

**CHROMATOGRAM #69**

- **Application**: Trace hydrocarbons in Oxygen
- **Instrument**: MultiDetek2 compact GC
- **Detector**: PlasmadetekE
- **Carrier Gas**: Nitrogen
- **Impurities**:
  - CH₄: 75ppm
  - NMHC: 125ppm
- **Sample**: Oxygen

**CHROMATOGRAM #70**

- **Application**: Trace Krypton & Xenon
- **Instrument**: MultiDetek2 compact GC
- **Detector**: PlasmaDetek2
- **Column**: HayeSep
- **Carrier Gas**: Helium
- **Impurities**:
  - Krypton: 1.9ppm
  - Xenon: 3.8ppm
- **Sample**: Oxygen

**CHROMATOGRAM #71**

- **Application**: Trace impurities in UHP Hydrogen
- **Instrument**: MultiDetek2 compact GC
- **Detector**: PlasmaDetek2
- **Carrier Gas**: Helium
- **Impurities**:
  - H₂: 101ppm
  - CH₄: 9.8ppm
  - C₂H₆: 9.7ppm
  - C₃+: 6.5ppm
- **Sample**: Hydrogen

**CHROMATOGRAM #72**

- **Application**: Trace impurities in Propylene
  - **Instrument**: MultiDetek2 compact GC
  - **Detector**: PlasmaDetek2
  - **Carrier Gas**: Helium
  - **Impurities**:
    - CO₂: 9.4ppm
    - C₂H₂: 8.1ppm
    - C₂H₄: 8.7ppm
    - C₂H₆: 8.4ppm
    - C₃H₈: 4.1ppm
    - O₂: 8.7ppm
    - N₂: 9.4ppm
    - CO: 9.1ppm
    - T-2-C₄H₈: 5.4ppm
    - I-C₄H₈: 8.1ppm
    - I-C₅H₁₂: 8.7ppm
    - C-2-C₄H₈: 6.4ppm
    - N-C₅H₁₂: 8.1ppm
    - I-C₄H₁₀: 1.7ppm
    - 1,3 C₄H₆: 5.4ppm
- **Sample**: Propylene

**CHROMATOGRAM #73**

- **Application**: Trace impurities in Argon (windex)
  - **Instrument**: MultiDetek2 compact GC
  - **Detector**: PlasmaDetek2
  - **Carrier Gas**: Argon
  - **Impurities**:
    - N₂: 6.4ppm
    - CO₂: 6.5ppm
    - Ethanol: 11.7ppm
- **Sample**: Argon
CHROMATOGRAM #83

- Application: Trace impurities in Oxygen used for aviation breathing
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier gas: Helium
- Impurities:
  - O2: 12.1%
  - CO2: 11.9%
  - N2: 30%
  - O3: 0.6 ppm
  - CH4: 1.5 ppm
  - CO: 0.6 ppm
  - Xe: 1.2 ppm
- Sample: Oxygen

CHROMATOGRAM #84

- Application: Trace impurities in Nitrous Oxide
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier gas: Helium
- Impurities:
  - Freon 22: 1.98 ppm
  - Freon 113: 1.98 ppm
  - NMHC: 0.6 ppm
  - CH4: 2 ppm
  - CO2: 0.6 ppm
  - CO: 1.2 ppm
- Sample: Nitrous Oxide (N2O)

CHROMATOGRAM #85

- Application: Trace impurities in Air
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier gas: Helium
- Impurities:
  - Ne: 5.2 ppm
  - Kr: 1.0 ppm
  - Ar: 5.0 ppm
  - Xe: 5.0 ppm
- Sample: Air

CHROMATOGRAM #86

- Application: Trace impurities in Methane
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier gas: Argon
- Impurities:
  - N2: 0.998 ppm
  - CO: 1.998 ppm
  - CO2: 1.26 ppm
  - H2: 1.0 ppm
  - CH4: 1 ppm
- Sample: Methane (CH4)

CHROMATOGRAM #87

- Application: Analysis of Excimer laser gas mixture
- Instrument: MultiDetek2 compact GC
- Detector: TCD
- Carrier gas: Argon & Helium
- Impurities:
  - H2: 1.01 ppm
  - He: 1.01 ppm
  - Ar: 3.02%
  - Freon 11-12-13: 5.92 ppm
  - N2O: 0.48%
  - Freon 113: 1 ppm
  - Freon 22: 1 ppm
  - Freon 11: 1 ppm
  - Freon 112: 1 ppm
- Sample: Excimer laser gas mixture

CHROMATOGRAM #88

- Application: Analysis of percent impurities in Nitrogen by TCD
- Instrument: MultiDetek2 compact GC
- Detector: TCD
- Carrier gas: Helium
- Impurities:
  - N2: 30%
  - O2: 30%
  - CO2: 12.1%
  - CO: 11.9%
  - NH3: 1.23%
- Sample: Gas mixture in nitrogen

CHROMATOGRAM #89

- Application: Analysis of trace odorant in Natural gas
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier gas: Helium
- Impurities:
  - THT: 2.4 ppm
- Sample: Natural gas

CHROMATOGRAM #90

- Application: Analysis of percent impurities in Nitrogen by TCD
- Instrument: MultiDetek2 compact GC
- Detector: TCD
- Carrier gas: Helium
- Impurities:
  - N2: 30%
  - O2: 30%
  - CO2: 12.1%
  - CO: 11.9%
  - NH3: 1.23%
- Sample: Gas mixture in nitrogen
**CHROMATOGRAM #91**

- Application: Analysis of percent impurities by TCD
- Instrument: MultiDetek2 compact GC
- Detector: TCD
- Carrier gas: Helium & Nitrogen
- Impurities:
  - He: 20%
  - H2: 5%
  - N2: 40%
- Sample: Gas mixture in Neon

**CHROMATOGRAM #92**

- Instrument: Micro Detek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - SF6: 5.00 ppm
- Sample: Xenon

**CHROMATOGRAM #93**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - NMHC: 5.00 ppm
- Sample: Xenon

**CHROMATOGRAM #94**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - N2: 5.00 ppm
- Sample: Xenon

**CHROMATOGRAM #95**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - O2: 5.00 ppm
  - CH4: 5.00 ppm
- Sample: Xenon

**CHROMATOGRAM #96**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CO: 5.00 ppm
  - CO2: 5.00 ppm
- Sample: Xenon

**CHROMATOGRAM #97**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - AR: 5.00 ppm
- Sample: Xenon

**CHROMATOGRAM #98**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CF4: 5.00 ppm
- Sample: Xenon
CHROMATOGRAM #99

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CO : 5.00 ppm
  - N2 : 5.00 ppm
- Sample: Krypton

CHROMATOGRAM #100

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CO2 : 5.00 ppm
  - CO : 5.00 ppm
- Sample: Krypton

CHROMATOGRAM #101

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - N2 : 5.00 ppm
- Sample: Krypton

CHROMATOGRAM #102

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - NMHC : 5.00 ppm
- Sample: Krypton

CHROMATOGRAM #99

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CF4 : 5.00 ppm
  - C2F6 : 5.00 ppm
- Sample: Krypton

CHROMATOGRAM #104

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - XE : 5.00 ppm
  - N2O : 5.00 ppm
- Sample: NF3

CHROMATOGRAM #106

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - N2O : 5.00 ppm
  - N2 : 5.00 ppm
- Sample: NF3
CHROMATOGRAM #115

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CO2: 5.00 ppm
  - CO: 5.00 ppm
- Sample: GEH4

CHROMATOGRAM #116

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - H2: 5.00 ppm
  - CH4: 5.00 ppm
- Sample: GEH4

CHROMATOGRAM #117

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - N2: 5.00 ppm
- Sample: GEH4
SAMPLES

Air .......................................................... 5-10-44-45-48-75-85-88
Argon .......................................................... 30-54-58-67-74
Carbon Dioxide .............................................. 76
Crude Argon .................................................. 52-53
Ethylene ...................................................... 66
Excimer laser gas mixture ................................. 87
Germane (GeH₄) ............................................ 113-114-115-116-117
Helium ....................................................... 19-39
Hexafluoro-2-butene ....................................... 82
Hydrogen .................................................... 15-31-40-46-56-57-71-79
Hydrogen Chloride ......................................... 25
Krypton ...................................................... 99-100-101-102-103-104
Methane ...................................................... 50-51-89
Natural gas .................................................. 86
Neon .......................................................... 38-91
Nitrogen ..................................................... 9-13-16-32-43-49-90
Nitrogen trifluoride (NF₃) ............................... 105-106-107-108
Nitrous oxide (N₂O) ....................................... 84-109-110-111-112
Octafluorocyclopentene .................................. 82
Propylene .................................................... 66-73
Sulfur hexafluoride ........................................ 42-63
Syngas ...................................................... 44-45
Tungsten hexafluoride ..................................... 81

CHROMATOGRAM #5

- Application: Analysis of low ppm/ppb acetic & sulfur in Air
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek-E (PED)
- Carrier gas: Helium
- Column: Stabilwax-DA, MXT-1, ShinCarbon

- Sample gas composition:
  - 880ppm Acetic acid
  - 800ppm H₂S
  - 850ppm COS
  - 240ppb Formic acid
  - 680ppb Acetic acid
  - Balance dry air

CHROMATOGRAM #10

- Detector: PlasmaDetek-E (PED)
- Instrument: MultiDetek micro GC series
- Configuration: Single injection at isothermal temperature
- Column: 2 Meters Packed ShinCarbon
- Column temperature: 200 Celsius
- Carrier Gas: Nitrogen
- Impurity concentrations:
  - CH₄: 9.56ppm
  - C₂H₆: 10.5ppm
  - C₂H₄: 10.4ppm
  - C₂H₂: 10.8ppm
  - N₂O: 2.4ppm
- Carrier Gas: Helium (Argon or Nitrogen can be used as well)
- Impurity concentrations:

CHROMATOGRAM #11

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column: 30 meter 0.53mm ID Alumina (5%OV-101)/Na₂SO₄
- Carrier flow rate: 40cm
- Sampling loop volume: 60μL
- Temperature: 40 Celsius isothermal until minute 3, and then 150 until minute 8
- Impurity concentrations:
  - C₂H₆: 5.1 ppm
  - C₂H₅: 4.0 ppm
  - C₂H₄: 6.6 ppm
  - C₂H₂: 5.9 ppm
  - C₂H₂: 4.4 ppm
  - C₂H₂: 6.5 ppm

- Carrier Gas: Helium (Argon or Nitrogen can be used as well)
- Impurity concentrations:
**CHROMATOGRAM #13**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters Plot MTX Q Bond 0.53mmID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 80 Celsius isothermal
- Impurity concentration: NH₃: 11.4 ppm

**CHROMATOGRAM #14**
- Trace Ar in Oxygen matrix
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Column type: 8 feet, 1/8'' Packed Stainless Steel ArgoTek (LDetek's column)
- Carrier flow rate: 20sccm
- Sampling loop volume: 50uL
- Column temperature: 45 Celsius isothermal
- Impurity concentration: Ar: 0.9 ppm

**CHROMATOGRAM #15**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration: Argon: 225 ppb

**CHROMATOGRAM #16**
- Instrument: Micro GC MultiDetek series
- Column: ArgoTek (LDetek's column)
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration: Ar: 179 ppb

**CHROMATOGRAM #17**
- Instrument: Micro GC MultiDetek series
- Column: ArgoTek (LDetek's column)
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentrations:
  - Argon: 201 ppb
  - Nitrogen: 126 ppb

**CHROMATOGRAM #19**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentrations:
  - Neon: 3.62ppm
  - Argon: 2.71ppm
  - Hydrogen: 5.27ppm
  - Oxygen: 5.41ppm
  - Methane: 5.13ppm
  - Non Methane hydrocarbons: 5.66ppm
  - Carbon monoxide: 5.12ppm

**CHROMATOGRAM #23**
- Application: Analysis of trace hydrocarbons, CO₂, N₂O in high purity Oxygen
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek (PED)
- Carrier gas: Nitrogen
- Columns: Packed Alumina, ShinCarbon, HayeSep D & CarboBlack
- Sample gas composition:
  - 18.1 ppm CH₄
  - 8.6 ppm C₂H₆
  - 8.2 ppm C₂H₄
  - 2.1 ppm C₄H₆
  - 1.8 ppm C₄H₈
  - 2.1 ppm C₂H₁₀
  - 4.1 ppm CO₂
  - 0.8 ppm N₂O
  - 1.1 ppm C₂H₂
  - 8.9 ppm C₃H₈
  - 8.7 ppm C₃H₆
  - Balance Oxygen

**CHROMATOGRAM #25**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon
- Impurity concentrations:
  - Hydrogen: 9.8ppm
  - Oxygen: 7.1ppm
  - Methane: 7.2ppm
  - Carbon dioxide: 5.12ppm
  - Carbon monoxide: 5.51ppm
CHROMATOGRAM #30
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Impurity concentrations:
  - Hydrogen: 5.1ppm
  - Oxygen: 4.6ppm
  - Nitrogen: 4.4ppm
  - Methane: 4.4ppm
  - Carbon dioxide: 4.7ppm
  - Carbon monoxide: 4.7ppm

CHROMATOGRAM #31
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentrations:
  - Oxygen: 2.6ppm
  - Nitrogen: 2.4ppm
  - Methane: 2.3ppm
  - Carbon dioxide: 2.4ppm
  - Carbon monoxide: 2.7ppm

CHROMATOGRAM #32
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon
- Impurity concentrations:
  - Methane: 2.3ppm
  - Nitrous oxide: 1.2ppm
  - Non Methane hydrocarbons: 1.3ppm

CHROMATOGRAM #33
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentrations:
  - Nitrogen: 0.9ppm
  - Carbon monoxide: 0.7ppm

CHROMATOGRAM #34
- Application: Analysis of low ppb H2-NMHC-CH4-N2-CO2-CO in electronic grade gas Oxygen
- Instrument: MultiDetek compact GC
- Detector: PlasmaDetek-E (PED)
- Carrier gas: Helium
- Columns: Packed
- Sample gas composition:
  - H2: 7.5ppb
  - NMHC: 9.1ppb
  - CH4: 6.1ppb
  - N2: 7.2 ppb
  - CO2 = 5.9ppb
  - CO= 4.1ppb

CHROMATOGRAM #35
- Application: Analysis of low ppb H2-NMHC-CH4-N2-CO2-CO in electronic grade gas Oxygen
- Instrument: MultiDetek compact GC
- Detector: PlasmaDetek-E (PED)
- Carrier gas: Helium
- Columns: Packed
- Sample gas composition:
  - H2: 111.9ppb
  - NMHC: 129.2ppb
  - CH4: 87.6ppb
  - N2: 124.3ppb
  - CO2: 84.4ppb
  - CO: 95.6ppb
CHROMATOGRAM #38

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED) & TCD
- Carrier Gas: Helium & Argon
- Impurity concentrations:
  - Nitrogen: 1.1 ppm
  - Oxygen: 1.6 ppm
  - Methane: 1.4 ppm
  - Carbon monoxide: 1.7 ppm
  - Hydrogen: 0.5 ppm

CHROMATOGRAM #39

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Column type: 30 meters Plot Molecular Sieve 0.53mmID
- Carrier flow rate: 8sccm
- Sampling loop volume: 160uL
- Column temperature: 70 Celsius isothermal
- Impurity concentrations:
  - Hydrogen: 4.12 ppm
  - Oxygen: 4.73 ppm
  - Nitrogen: 5.86 ppm
  - Non Methane hydrocarbons: 5.38 ppm
  - Carbon monoxide: 4.92 ppm

CHROMATOGRAM #40

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Impurity concentrations:
  - Nitrogen: 1.1 ppm
  - Methane: 1.2 ppm
  - Carbon monoxide: 1.7 ppm

CHROMATOGRAM #41

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon
- Column type: 1 meter micro packed 1/16''OD Rt - XLSulfurs
- Carrier flow rate: 8sccm
- Sampling loop volume: 200ul
- Column temperature: 60 Celsius isothermal
- Impurity concentrations:
  - H2S: 9.8 ppm
  - COS: 9.4 ppm

CHROMATOGRAM #42

- Application: Sulfur hexafluoride purity (SF6)
- Instrument: MultiDetek2 GC
- Detector: Plasmadetek2
- Carrier gas: Argon or Helium
- Sample gas:
  - O2: 1495 ppm
  - N2: 1448 ppm
  - CF4: 125 ppm
  - CO: 199 ppm
  - in SF6

CHROMATOGRAM #43

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon (Helium can be used as well)
- Column type: 1 meter micro packed 1/16"OD Rt - XLSulfurs
- Carrier flow rate: 8sccm
- Sampling loop volume: 200ul
- Column temperature: 60 Celsius isothermal
- Impurity concentrations:
  - H2S: 9.8 ppm
  - COS: 9.4 ppm

CHROMATOGRAM #44

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier type: 30 meters Plot MTX - Q-Bond 0.53mmID
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 100 Celsius isothermal
- Impurity concentrations:
  - H2S: 6.4 ppm
  - COS: 5.1 ppm

CHROMATOGRAM #45

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon
- Column type: 10 meters Plot MTX - Q-Bond 0.32mmID
- Carrier flow rate: 3sccm
- Sampling loop volume: 60uL
- Column temperature: 30 Celsius isothermal
- Impurity concentrations:
  - H2S: 6.4 ppm
  - COS: 5.1 ppm

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CHROMATOGRAM #46
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meters GasPro 0.32mmID
- Carrier flow rate: 3sccm
- Sampling loop volume: 140uL
- Impurity concentrations:
  - H₂S: 1.1ppm
  - CO₂: 0.8ppm

CHROMATOGRAM #47
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 2 x 10', 1/8'' Packed Stainless Steel Hayesep D
- Carrier flow rate: 30sccm
- Sampling loop volume: 1mL
- Column temperature: 50 Celsius isothermal
- Impurity concentrations:
  - Ar: 9.8 ppm
  - N₂: 10.9 ppm

CHROMATOGRAM #48
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon
- Impurity concentrations:
  - H₂: 2.2ppm
  - O₂: 2.1ppm
  - CO: 1.6ppm
  - CH₄: 1.6ppm
  - CO₂: 1.1ppm

CHROMATOGRAM #49
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium or Argon
- Impurity concentrations:
  - H₂: 1.1ppm
  - CO₂: 330 ppm
  - N₂O: 0.3 ppm

CHROMATOGRAM #50
- Instrument: MultiDetek2 GC
- Detector: Plasmadetek2
- Carrier gas: Helium
- Columns: 2 x 15 meters, 0.53mmID MXT-1701
- Columns temperature: 75 Celsius
- Carrier gas flow rate: 5sccm
- Sample gas: 10ppm THT in balance Helium

CHROMATOGRAM #51
- Application: Trace THT and TBM in natural gas
- Sample gas: TBM: 5ppm
  - THT: 4ppm
  - N₂: 98 ppm

CHROMATOGRAM #52
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Column type: 2 x 8 feet, 1/8'' packed Stainless Steel Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 200uL
- Column temperature: 60 Celsius isothermal
- Impurity concentration: N₂: 98 ppm
**CHROMATOGRAM #53**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Column type: Packed Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 50uL
- Column temperature: 60 Celsius isothermal
- Impurity concentration: Nitrogen: 212 ppm

**CHROMATOGRAM #54**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 30 meter 0.53mmID Plot Alumina BOND/Na2SO4
- Carrier flow rate: 4sccm
- Sampling loop volume: 60uL
- Column temperature: 40 Celsius isothermal
- Impurity concentration: N2O: 5.4 ppm

**CHROMATOGRAM #56**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Column type: 12 feet, 1/8'' Packed Stainless Steel Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 500uL
- Column temperature: 60 Celsius isothermal
- Impurity concentrations: O2: 4.7 ppm, N2: 5.0 ppm

**CHROMATOGRAM #57**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 2 x 8 feet, 1/8'' Packed Stainless Steel Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 160uL
- Column temperature: 70 Celsius isothermal
- Impurity concentrations: O2: 5.7 ppm, N2: 12.0 ppm

**CHROMATOGRAM #58**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Impurity concentrations: Hydrogen: 0.9 ppm, Oxygen: 0.9 ppm, Nitrogen: 0.95 ppm, Methane: 1.1 ppm

**CHROMATOGRAM #59**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 2 x 8 feet, 1/8'' Packed Stainless Steel Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 160uL
- Column temperature: 60 Celsius isothermal
- Impurity concentrations: O2: 5.7 ppm, N2: 12.0 ppm

**CHROMATOGRAM #60**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium (Argon can be used as well)
- Column type: 12 feet, 1/8'' Packed Stainless Steel Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 500uL
- Column temperature: 60 Celsius isothermal
- Impurity concentrations: O2: 4.7 ppm, N2: 5.0 ppm

**CHROMATOGRAM #61**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Argon
- Column type: Packed Molecular Sieve
- Carrier flow rate: 30sccm
- Sampling loop volume: 50uL
- Column temperature: 60 Celsius isothermal
- Impurity concentration: Nitrogen: 212 ppm

**CHROMATOGRAM #62**
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration: SF6: 5.1 ppm

**CHROMATOGRAM #63**
- Instrument: MultiDetek2 GC
- Detector: PlasmaDetek2
- Carrier gas: Helium
- Columns: Packed Hayesep Q 10'
- Columns temperature: 45 Celsius
- Carrier gas flow rate: 20sccm
- Sample gas: 8ppm CF4 in balance Helium

**CHROMATOGRAM #64**
- Application: Trace impurities
H2-CO2-N2-O2-CO in Refinery/Petrochemical gases
- Instrument: MultiDetek2 GC
- Detector: PlasmaDetek2
- Carrier gas: Helium or Argon
- Columns: Q Bond pre column combined with Mol Sieve second column
- Sample gas:
  - H2: 8.3 ppm
  - CO2: 9.5 ppm
  - N2: 5.0 ppm
  - O2: 9.0 ppm
  - CO: 5.2 ppm
- in balance Propylene

**CHROMATOGRAM #65**
- Application: Trace impurities
H2-O2-N2-CH4-CO-CO2 in Refinery/Petrochemical gases
- Instrument: MultiDetek2 GC
- Detector: PlasmaDetek2
- Carrier gas: Helium or Argon
- Columns: Q Bond pre column combined with Mol Sieve second column
- Sample gas:
  - H2: 8.1 ppm
  - O2: 9.1 ppm
  - N2: 10.5 ppm
  - CH4: 9.6 ppm
  - CO: 9.6 ppm
  - CO2: 5.2 ppm
- in balance Propylene
CHROMATOGRAM #67

- Instrument: MultiDetek2 GC
- Detector: PlasmaDetek2
- Carrier Gas: Argon
- Impurities:
  - H2: 6.8ppm
  - CO2: 6.3ppm
  - N2: 6.4ppm
  - CH4: 6.9ppm
  - CO: 6.5ppm
  - CO2: 5.1ppm
  - NMHC: 4.1ppm

Sample: Argon

CHROMATOGRAM #68

- Application: Trace hydrocarbons in Oxygen
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetekE
- Carrier Gas: Helium
- Impurities:
  - CH4: 75ppm
  - NMHC: 125ppm

Sample: Oxygen

CHROMATOGRAM #69

- Application: Trace hydrocarbons in Oxygen
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier Gas: Nitrogen
- Impurities:
  - CH4: 101ppm
  - C2H2: 9.9ppm
  - C2H4: 9.6ppm
  - C2H6: 9.7ppm

Sample: Oxygen

CHROMATOGRAM #70

- Application: Trace impurities in UHP hydrogen
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier Gas: Helium
- Impurities:
  - Ar: 2.4ppm
  - Kr: 2.1ppm
  - N2: 1.7ppm

Sample: Hydrogen

CHROMATOGRAM #71

- Application: Trace impurities in Propylene
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier Gas: Helium
- Impurities:
  - CO2: 9.4ppm
  - C2H2: 8.1ppm
  - C2H4: 8.7ppm
  - C2H6: 8.4ppm
  - C3H8: 4.1ppm
  - O2: 8.7ppm
  - N2: 9.4ppm
  - CH4: 9.1ppm
  - CO: 4.7ppm
  - T-2-C4H8: 5.4ppm
  - I-C4H8: 8.1ppm
  - I-C5H12: 8.7ppm
  - C-2-C4H8: 6.4ppm
  - N-C5H12: 8.1ppm
  - I-C4H10: 1.7ppm
  - 1,3 C4H6: 5.4ppm

Sample: Propylene

CHROMATOGRAM #72

- Application: Trace impurities in Argon (winery)
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier Gas: Argon
- Impurities:
  - N2: 6.4ppm
  - CO2: 6.1ppm
  - Ethanol: 11.7ppm

Sample: Argon

CHROMATOGRAM #73

- Application: Trace impurities in air (environmental)
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier Gas: Helium
- Impurities:
  - CH4: 2.1ppm
  - CO2: 397ppm
  - SF6: 201ppb
  - N2O: 330ppb

Sample: Propylene

CHROMATOGRAM #74

- Application: Trace impurities in Argon (winery)
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier Gas: Argon
- Impurities:
  - N2: 6.4ppm
  - CO2: 6.1ppm
  - Ethanol: 11.7ppm

Sample: Argon

CHROMATOGRAM #75

- Application: Trace impurities in air (environmental)
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier Gas: Helium
- Impurities:
  - CH4: 2.1ppm
  - CO2: 307ppb
  - SF6: 201ppb
  - N2O: 330ppb

Sample: Argon
**CHROMATOGRAM #76**

- **Application:** Trace impurities in Carbon dioxide
- **Instrument:** MultiDetek2 compact GC
- **Detector:** PlasmaDetek2
- **Carrier Gas:** Helium
- **Impurities:**
  - N2: 8.8 ppm
  - Acetaldehyde (C2H4O): 91.4 ppb
  - CO: 7.7 ppm
  - Benzene (C6H6): 71.6 ppb
- **Sample:** Carbon dioxide

**CHROMATOGRAM #78**

- **Application:** Trace impurities and hydrocarbons in Oxygen
- **Instrument:** MultiDetek2 compact GC
- **Detector:** PlasmaDetek2
- **Carrier Gas:** Helium
- **Impurities:**
  - H2: 1.57 ppm
  - N2: 1.80 ppm
  - CH4: 1.55 ppm
  - C2H2: 1.11 ppm
  - C2H4: 1.28 ppm
  - CO2: 1.07 ppm
  - C2H6: 1.35 ppm
  - CO: 1.79 ppm
- **Sample:** Oxygen

**CHROMATOGRAM #79**

- **Application:** Trace impurities and hydrocarbons in Hydrogen
- **Instrument:** MultiDetek2 compact GC
- **Detector:** PlasmaDetek2
- **Carrier Gas:** Helium
- **Impurities:**
  - O2: 1.88 ppm
  - N2: 1.42 ppm
  - CH4: 1.25 ppm
  - CO2: 1.75 ppm
  - C2H2: 1.12 ppm
  - C2H4: 1.07 ppm
  - CO: 1.37 ppm
  - C2H6: 1.00 ppm
- **Sample:** Hydrogen

**CHROMATOGRAM #80**

- **Application:** Trace impurities at low ppb in Oxygen for semiconductor industry
- **Instrument:** MultiDetek2 compact GC
- **Detector:** PlasmaDetek2
- **Carrier Gas:** Helium
- **Impurities:**
  - Ar: 796 ppb
  - H2: 795 ppb
  - Kr: 794 ppb
  - CO2: 802 ppb
  - Xe: 796 ppb
  - N2: 802 ppb
  - CO2: 799 ppb
  - CH4: 802 ppb
  - N2O: 798 ppb
  - NMHC: 798 ppb
- **Sample:** Oxygen

**CHROMATOGRAM #81**

- **Application:** Trace impurities in WF6
- **Instrument:** MultiDetek2 compact GC
- **Detector:** PlasmaDetek2
- **Carrier Gas:** Helium
- **Impurities:**
  - H2: 3.23 ppm
  - O2: 4.11 ppm
  - N2: 3.10 ppm
  - CO: 4.50 ppm
  - CF4: 4.56 ppm
  - CO2: 3.87 ppm
  - N2O: 2.33 ppm
  - SF6: 5.1 ppm
- **Sample:** Tungsten hexafluoride (WF6)

**CHROMATOGRAM #82**

- **Application:** Trace impurities in C4F6 & C5F8
- **Instrument:** MultiDetek2 compact GC
- **Detector:** PlasmaDetek2
- **Carrier Gas:** Helium
- **Impurities:**
  - H2: 10.6 ppm
  - O2: 10.6 ppm
  - N2: 12.1 ppm
  - CH4: 10.6 ppm
  - CF4: 9.2 ppm
  - CO2: 9.8 ppm
  - CO: 9.8 ppm
- **Sample:** Hexafluoro-2-butyne (C4F6) and Octafluorocyclopentene (C5F8)

**CHROMATOGRAM #83**

- **Application:** Trace impurities in Nitrous Oxide used for aviation breathing
- **Instrument:** MultiDetek2 compact GC
- **Detector:** PlasmaDetek2
- **Carrier Gas:** Helium
- **Impurities:**
  - CO: 1.998 ppm
  - CO2: 1.26 ppm
- **Sample:** Nitrous Oxide (N2O)

**CHROMATOGRAM #84**

- **Application:** Trace impurities in freons
- **Instrument:** MultiDetek2 compact GC
- **Detector:** PlasmaDetek2
- **Carrier Gas:** Argon
- **Impurities:**
  - CH4: 2.2 ppm
  - N2O: 1.5 ppm
  - CO2: 0.9 ppm
  - NMHC: 5.6 ppm
- **Sample:** Nitrous Oxide (N2O)
**CHROMATOGRAM #85**

- Application: Trace impurities noble gases in Air
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier gas: Helium
- Impurities:
  - Ne: 5.2 ppm
  - Kr: 1.0 ppm
  - Ar: 5.0 ppm
  - Xe: 5.0 ppm
- Sample: Air

**CHROMATOGRAM #86**

- Application: Trace impurities in Methane
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier gas: Argon
- Impurities:
  - N2: 0.998 ppm
- Sample: Methane (CH4)

**CHROMATOGRAM #87**

- Application: Analysis of Excimer laser gas mixture
- Instrument: MultiDetek2 compact GC
- Detector: TCD
- Carrier gas: Argon & Helium
- Impurities:
  - He: 101 ppm
  - Kr: 1.01%
  - Ar: 3.02%
  - F2: 0.48%
- Sample: Excimer laser gas mixture

**CHROMATOGRAM #88**

- Application: Analysis of percent impurities in Nitrogen by TCD
- Instrument: MultiDetek2 compact GC
- Detector: TCD
- Carrier gas: Helium
- Impurities:
  - O2: 12.1%
  - CO2: 11.9%
  - NH3: 1.23%
- Sample: Gas mixture in Nitrogen

**CHROMATOGRAM #89**

- Application: Analysis of trace odorant in Natural gas
- Instrument: MultiDetek2 compact GC
- Detector: PlasmaDetek2
- Carrier gas: Helium
- Impurities:
  - THT: 2.4 ppm
- Sample: Natural gas

**CHROMATOGRAM #90**

- Application: Analysis of percent impurities by TCD
- Instrument: MultiDetek2 compact GC
- Detector: TCD
- Carrier gas: Helium
- Impurities:
  - O2: 12.1%
  - CO2: 11.9%
  - NH3: 1.23%
- Sample: Gas mixture in Nitrogen

**CHROMATOGRAM #91**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration: SF6: 5.00 ppm
- Sample: Xenon

**CHROMATOGRAM #92**

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration: SF6: 5.00 ppm
- Sample: Xenon
CHROMATOGRAM #93
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - NMHC: 5.00 ppm
- Sample: Xenon

CHROMATOGRAM #94
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CO: 5.00 ppm
  - CO2: 5.00 ppm
- Sample: Xenon

CHROMATOGRAM #95
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CH4: 5.00 ppm
- Sample: Xenon

CHROMATOGRAM #96
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CO: 5.00 ppm
  - CO2: 5.00 ppm
- Sample: Xenon

CHROMATOGRAM #97
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - H2: 5.00 ppm
  - O2: 5.00 ppm
  - CH4: 5.00 ppm
- Sample: Xenon

CHROMATOGRAM #98
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CF4: 5.00 ppm
- Sample: Xenon

CHROMATOGRAM #99
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CF4: 5.00 ppm
- Sample: Krypton

CHROMATOGRAM #100
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CO: 5.00 ppm
  - CO2: 5.00 ppm
- Sample: Krypton
CHROMATOGRAM #101
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - N2: 5.00 ppm
- Sample: Krypton

CHROMATOGRAM #102
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - NMHC: 5.00 ppm
- Sample: Krypton

CHROMATOGRAM #103
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - O2: 5.00 ppm
  - CH4: 5.00 ppm
- Sample: Krypton

CHROMATOGRAM #104
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - XE: 5.00 ppm
- Sample: Krypton

CHROMATOGRAM #105
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CO2: 5.00 ppm
  - N2: 5.00 ppm
  - CH4: 5.00 ppm
  - H2: 5.00 ppm
  - CO: 5.00 ppm
- Sample: NF3

CHROMATOGRAM #106
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - N2O: 4.90 ppm
- Sample: NF3

CHROMATOGRAM #107
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - AR + O2: 5.00 ppm
- Sample: NF3

CHROMATOGRAM #108
- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - SF6: 5.00 ppm
  - CF4: 5.00 ppm
- Sample: NF3
CHROMATOGRAM #109

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - AR: 5.00 ppm
- Sample: GEH4

CHROMATOGRAM #110

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - C2H2: 3.72 ppm
  - C2H4: 4.62 ppm
  - C2H6: 4.55 ppm
- Sample: GEH4

CHROMATOGRAM #111

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - H2: 5.73 ppm
  - CO2: 6.05 ppm
  - N2: 4.45 ppm
  - CH4: 7.04 ppm
  - C0: 6.65 ppm
  - CO2: 6.14 ppm
- Sample: GEH4

CHROMATOGRAM #112

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - NE: 4.86 ppm
- Sample: GEH4

CHROMATOGRAM #113

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - AR: 4.65 ppm
- Sample: N2O

CHROMATOGRAM #114

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - C2H2: 5.00 ppm
  - C2H4: 5.00 ppm
  - C2H6: 5.00 ppm
- Sample: GEH4

CHROMATOGRAM #115

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - CO2: 5.00 ppm
  - O2: 5.00 ppm
- Sample: GEH4

CHROMATOGRAM #116

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - H2: 5.00 ppm
  - CH4: 5.00 ppm
  - O2: 5.00 ppm
- Sample: GEH4
CHROMATOGRAM #117

- Instrument: Micro GC MultiDetek series
- Detector: PlasmaDetek series (PED)
- Carrier Gas: Helium
- Impurity concentration:
  - N2: 5.00 ppm
- Sample: GEH4

0 200 400 600 800 1000 1200 1400 1600

Where innovation leads to success
INTELLIGENT PLASMA EMISSION DETECTOR SYSTEM
FOR GAS CHROMATOGRAPH

The following form will help us designing a detection system that fits perfectly your needs. The more we know about your application, the better your PlasmaDetek will work for you.

YOUR GAS CHROMATOGRAPH

1) GC manufacturer and model: ________________________________

2) GC input detector voltage scale (Volts): ________________________________

3) Power supply (80 to 240 VAC; 50-60 Hz): ________________________________

4) Column Type: ________________________________

5) Operating temperature: ________________________________

6) Chromatographic valves type: ________________________________

APPLICATION REQUIRED

1) Gas composition:

2) Impurities to be measured:

3) Measurement range:

4) Lower detection limit:

5) Sample pressure and temperature:
MICRO GC FOR MULTIPLE IMPURITIES

The following form will help us designing a complete gas chromatograph that fits perfectly your needs. The more we know about your application, the better your MultiDetek will work for you.

TECHNICAL DETAILS

1) Power supply (80 to 240 VAC; 50-60 Hz):

APPLICATION REQUIRED

1) Gas composition:

2) Impurities to be measured:

3) Measurement range:

4) Lower detection limit:

5) Sample pressure and temperature:
LDP1000 SERIES

GAS PURIFIER COMPATIBLE WITH ANY TRACE GAS ANALYSIS SYSTEM

The LDP1000 series is a sub ppb purifier used for generating high purity calibration gas for online analyzers as well as generating high purity carrier gas for gas chromatograph.

Designed with two steps of purification, this purifier design ensures no undesired impurity is released during process.

WHY CHOOSING LDP1000 SERIES?

- **2 beds of purification**
  Allows perfect purification

- **RS-232 port**
  Monitor the temperature of the 2 beds of purification

- **LEDs indication**
  Self-diagnostic and status of the purifier

- **Cost effective solution for long-term use**
  Interchangeable getter

- **Available in different format**
  Compact version makes it ideal when space is limited

- **Real end of life monitoring**
  Combined with PED technology and MultiDetek series, LDP1000 series gas purity can be monitored in real time to offer real auto diagnostic.

Optional supporting plate with in/out isolation valves and bypass valve

COMPACT-LDP1000 version
Where innovation leads to success

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