LDetek

CHROMATOmag

THIRD EDITION

▲ MultiDetek2

▲ PlasmaDetek2

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.

LDetek

Where innovation leads to success

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ENVIRONMENT

NATURAL GAS

INDUSTRIAL GAS

HYDROCARBONS PROCESSING

PETROCHEMICAL

FOOD AND BEVERAGE

AGRICULTURE

PHARMACEUTICAL AND MEDECINE

ELECTRONIC GASES & SEMICONDUCTOR

HEALTH AND SAFETY

ENERGY

LDetek

PlasmaDetek 2

LDetek

INTELLIGENT PLASMA EMISSION DETECTOR SYSTEM
FOR GAS CHROMATOGRAPH

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 customable 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 customable protocol to control the device
- Detect organic and inorganic compounds, permanent gases and noble gases (including Ne)

MultiDetek 2

LDetek

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

NEW ERA

OF LIGHT HYDROCARBON MEASUREMENT

LDetek

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

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

SAFE

No fuel (H_2) and no related safety accessories

SENSITIVE

< 1 ppb lowest detection possible

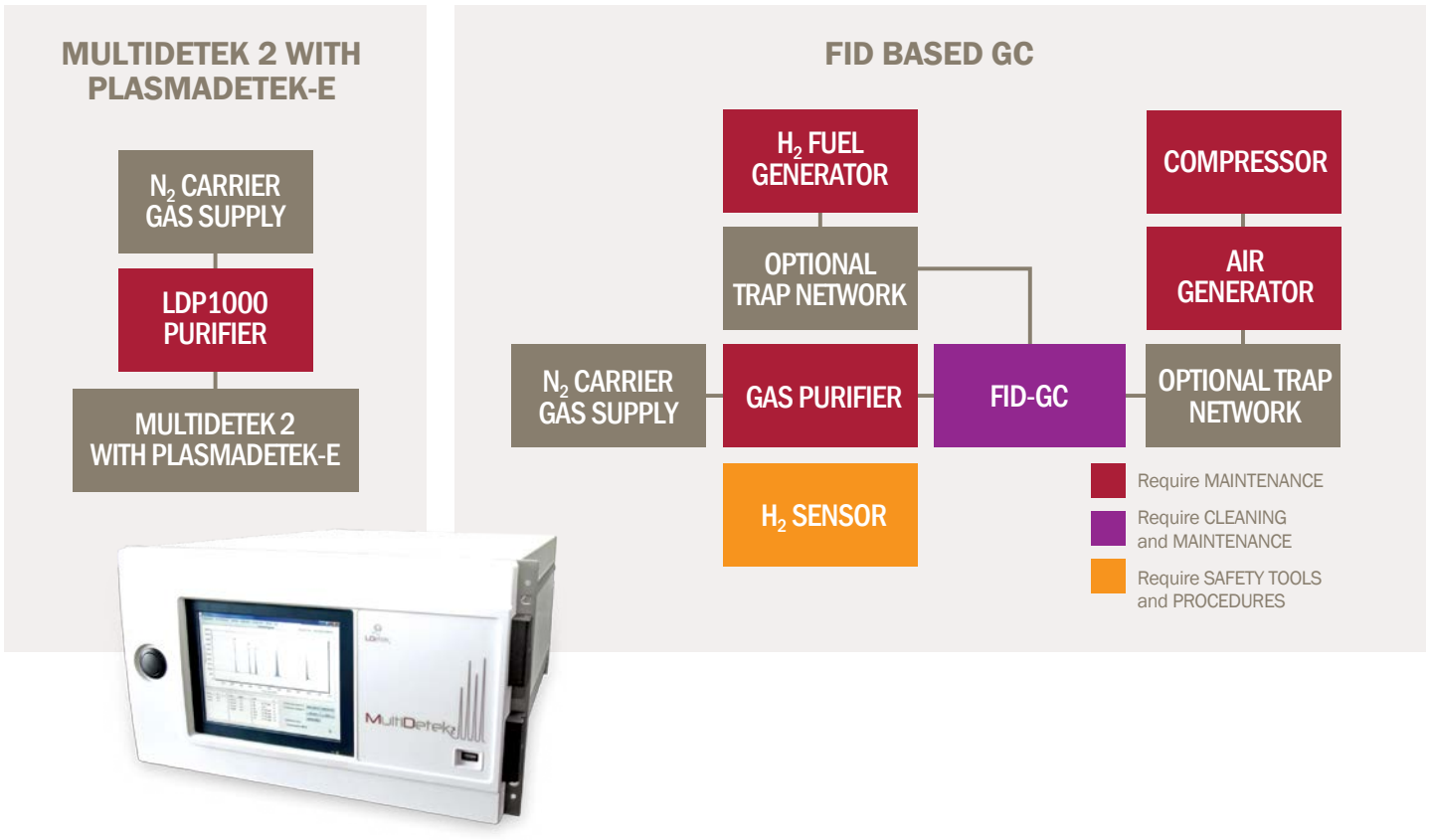
LOW OPERATING COST

Only N_2 carrier gas supply

MAINTENANCE FREE

No periodic detector cleaning

TYPICAL INSTALLATION FOR LIGHT HYDROCARBON MEASUREMENT



INSTALLATION COST* COMPARISON

Parts	MultiDetek 2 with PlasmaDetek-E	FID-GC
H_2 generator	N/A	$7200
Zero air generator	N/A	$2125
Air compressor	N/A	$1200
H_2 safety accessories	N/A	$1500
2 year maintenance cost	$2000	$5000
Total cost*	**$2000**	**$17 025**

* costs are approximate and may vary for each system

N/A: not applicable

Please consult Application Note LD14-01 on LDetek web site for more technical details.

LDetek is proud to publish its third 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 micro GC MultiDetek 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; Plot, 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**.

IMPURITIES

Chromatograms #

Acetaldehyde	**1-2-3-4**
Acetic acid	**5**
Acetylene	**6-7-8-9-10-11-23**
Ammonia	**13**
Argon	**14-15-16-17-18-19**
Arsine	**20-21-22**
C4H6	**23**
C4H8	**23**
C4H10	**23**
Carbon dioxyde	**1-24-25-26-27-64-65-30-19-31-32-33-23-34-35-36-37-66**
Carbon monoxyde	**6-25-38-30-19-39-31-40-32-33-41-34-35-36-37-42-66**
Carbonyl sulfide	**5-43-44-45-46**
Ethane	**6-7-8-9-10-23**
Ethylene	**6-7-8-9-10-23**
Formaldehyde	**3-4**
Formic acid	**5**
Helium	**38**
Hydrogen	**6-25-18-38-30-58-19-39-32-33-34-35-36-37-66**
Hydrogen sulfide	**5-43-44-45-46**
Isobutylene	**6-7-8**
Krypton	**18-47**
Methane	**6-25-7-10-26-27-48-38-30-58-19-39-31-40-32-49-33-19-23-34-35-36-37-66**
Neon	**18-19**
Nitrogen	**17-24-6-47-52-53-56-57-38-30-58-19-39-31-40-33-41-34-35-36-37-42-66**
Nitrous oxyde	**11-27-48-54-49-23-5**
Non methane hydrocarbons	**19-33-34-35-36-37**
Oxygen	**6-25-56-57-30-38-58-19-39-31-32-42-66**
Phosphine	**59-60-61**
Propane	**6-7-8-9-10-23**
Propylene	**6-7-8-9-10-23**
Sulfur hexafluoride	**42-62**
Tetrafluoromethane	**42-63**
Water	**1-8-13-20-21-3-44-45-61-64-65**

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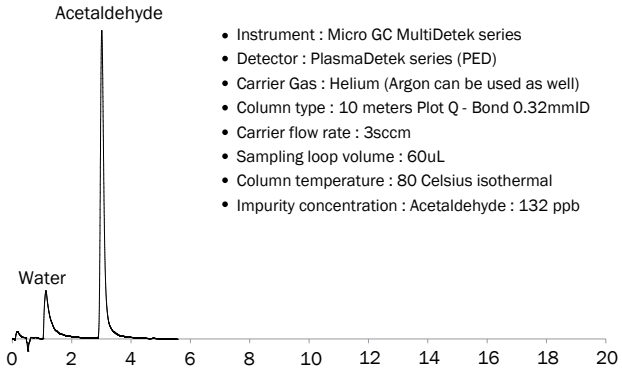
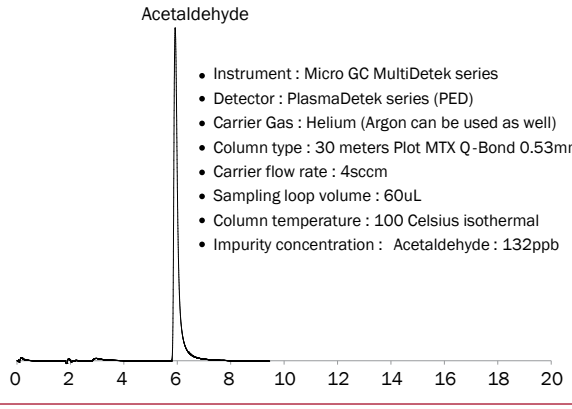
CHROMATOGRAM #1



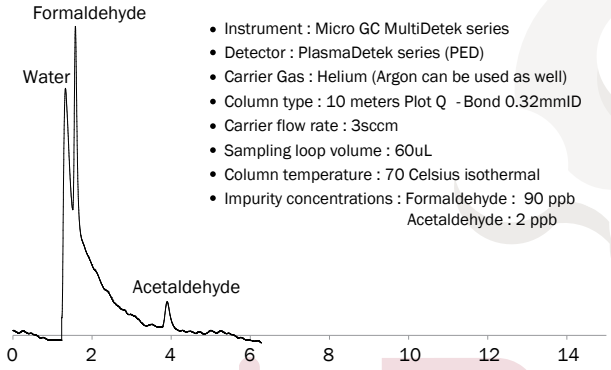
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 10 meters Plot Q - Bond 0.32mmID
- Carrier flow rate : 3sccm
- Sampling loop volume : 60uL
- Column temperature : 80 Celsius isothermal
- Impurity concentration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

CHROMATOGRAM #2



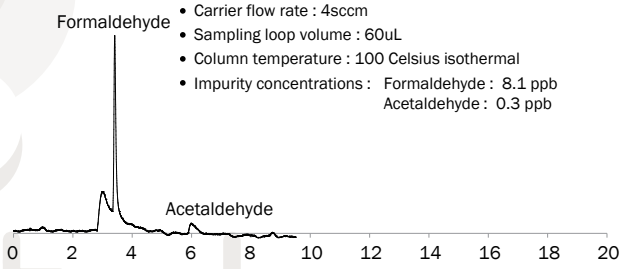
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 100 Celsius isothermal
- Impurity concentration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

CHROMATOGRAM #3



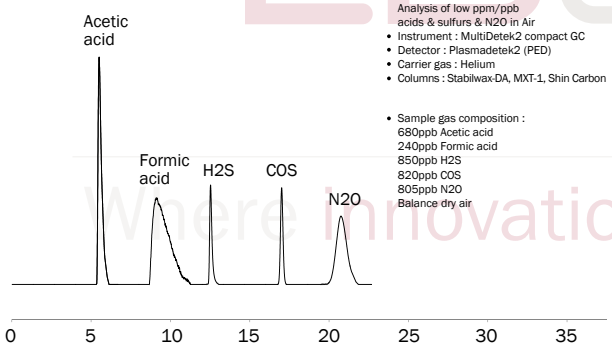
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 10 meters Plot Q - Bond 0.32mmID
- Carrier flow rate : 3sccm
- Sampling loop volume : 60uL
- Column temperature : 70 Celsius isothermal
- Impurity concentrations : Formaldehyde : 90 ppb
  Acetaldehyde : 2 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 concentrations : Formaldehyde : 8.1 ppb
  Acetaldehyde : 0.3 ppb

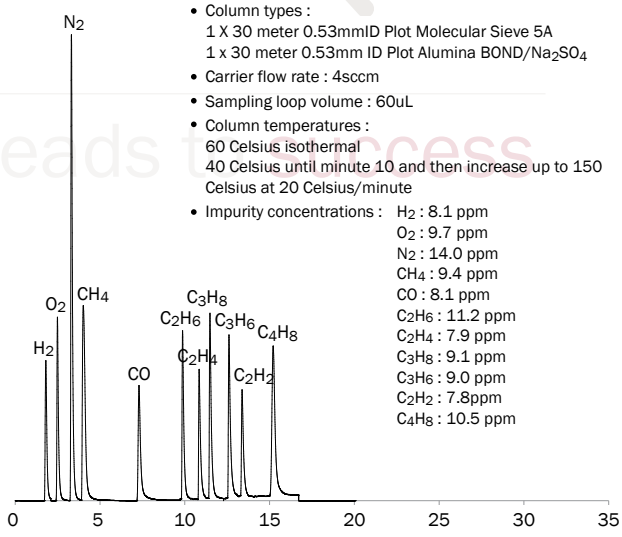
CHROMATOGRAM #5



- Application :
  Analysis of low ppm/ppb
  acids & sulfurs & N20 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 N20
  Balance dry air

CHROMATOGRAM #6



- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column types :
  1 X 30 meter 0.53mmID Plot Molecular Sieve 5A
  1 x 30 meter 0.53mm ID Plot Alumina BOND/Na_2SO_4
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperatures :
  60 Celsius isothermal
  40 Celsius until minute 10 and then increase up to 150 Celsius at 20 Celsius/minute
- Impurity concentrations : H_2 : 8.1 ppm
  O_2 : 9.7 ppm
  N_2 : 14.0 ppm
  CH_4 : 9.4 ppm
  CO : 8.1 ppm
  C_2H_6 : 11.2 ppm
  C_2H_4 : 7.9 ppm
  C_3H_8 : 9.1 ppm
  C_3H_6 : 9.0 ppm
  C_2H_2 : 7.8ppm
  C_4H_8 : 10.5 ppm

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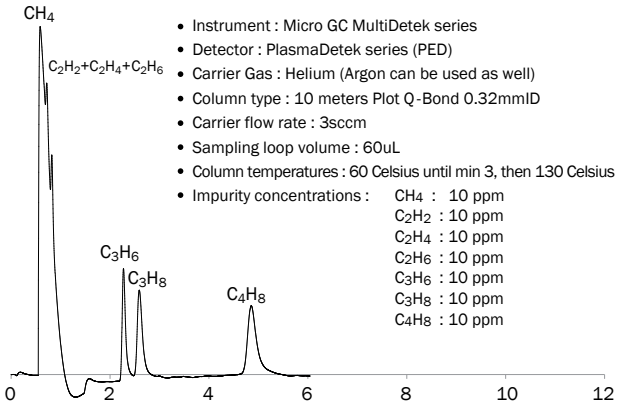
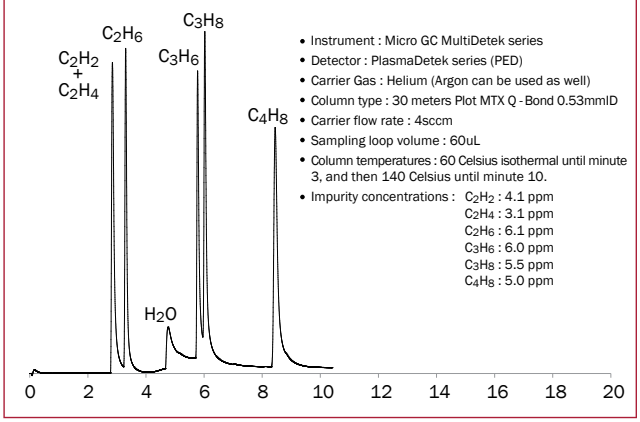
CHROMATOGRAM #7



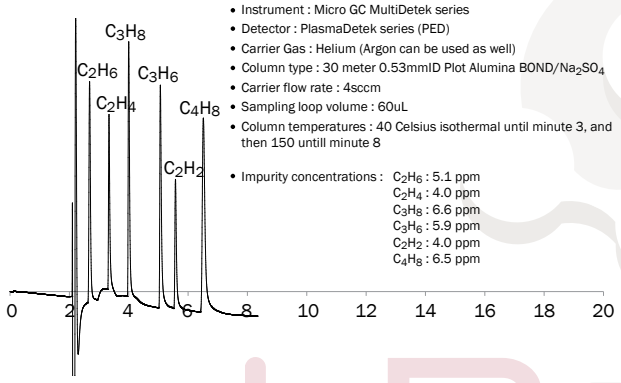
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 10 meters Plot Q-Bond 0.32mmID
- Carrier flow rate : 3sccm
- Sampling loop volume : 60uL
- Column temperatures : 60 Celsius until min 3, then 130 Celsius
- Impurity concentrations : CH_4 : 10 ppm
  C_2H_2 : 10 ppm
  C_2H_4 : 10 ppm
  C_2H_6 : 10 ppm
  C_3H_6 : 10 ppm
  C_3H_8 : 10 ppm
  C_4H_8 : 10 ppm

CHROMATOGRAM #8



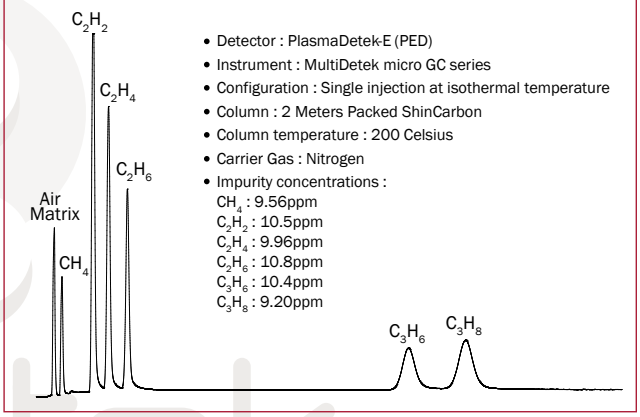
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperatures : 60 Celsius isothermal until minute 3, and then 140 Celsius until minute 10.
- Impurity concentrations : C_2H_2 : 4.1 ppm
  C_2H_4 : 3.1 ppm
  C_2H_6 : 6.1 ppm
  C_3H_6 : 6.0 ppm
  C_3H_8 : 5.5 ppm
  C_4H_8 : 5.0 ppm

CHROMATOGRAM #9



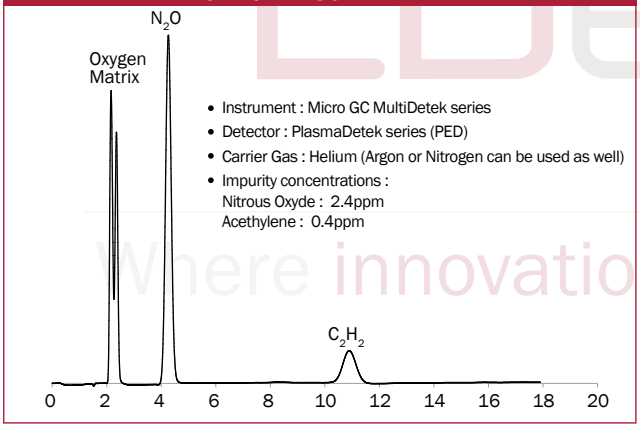
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meter 0.53mmID Plot Alumina BOND/Na_2SO_4
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperatures : 40 Celsius isothermal until minute 3, and then 150 untill minute 8
- Impurity concentrations : C_2H_6 : 5.1 ppm
  C_2H_4 : 4.0 ppm
  C_3H_8 : 6.6 ppm
  C_3H_6 : 5.9 ppm
  C_2H_2 : 4.0 ppm
  C_4H_8 : 6.5 ppm

CHROMATOGRAM #10



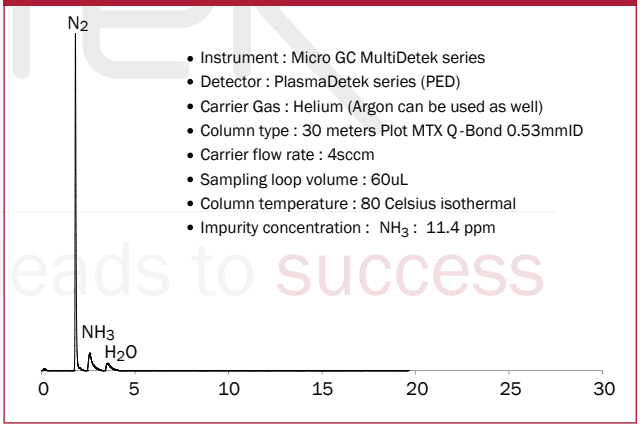
- Detector : PlasmaDetek-E (PED)
- Instrument : MultiDetek micro GC series
- Configuration : Single injection at isothermal temperature
- Column : 2 Meters Packed ShinCarbon
- Column temperature : 200 Celsius
- Carrier Gas : Nitrogen
- Impurity concentrations :
  CH_4 : 9.56ppm
  C_2H_2 : 10.5ppm
  C_2H_4 : 9.96ppm
  C_2H_6 : 10.8ppm
  C_3H_6 : 10.4ppm
  C_3H_8 : 9.20ppm

CHROMATOGRAM #11



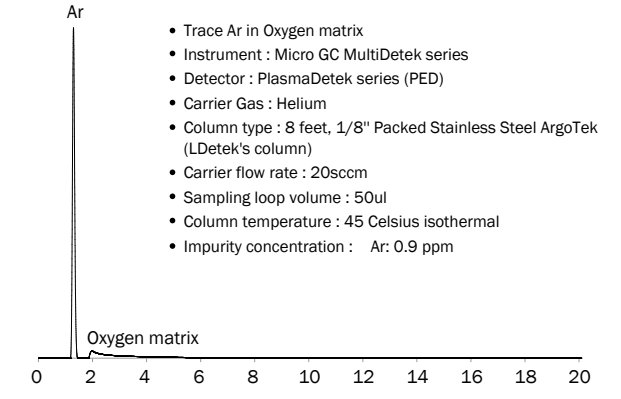
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon or Nitrogen can be used as well)
- Impurity concentrations :
  Nitrous Oxyde : 2.4ppm
  Acethylene : 0.4ppm

CHROMATOGRAM #13



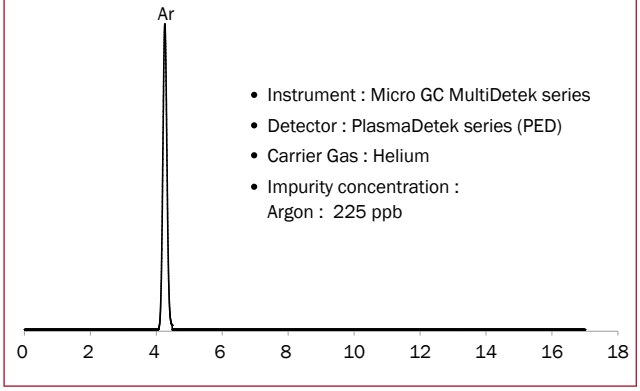
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 80 Celsius isothermal
- Impurity concentration : NH_3 : 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

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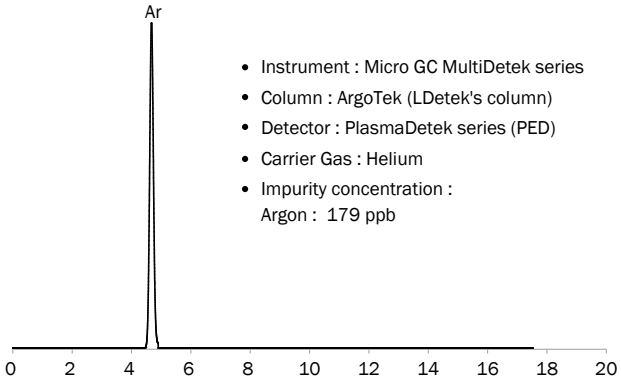
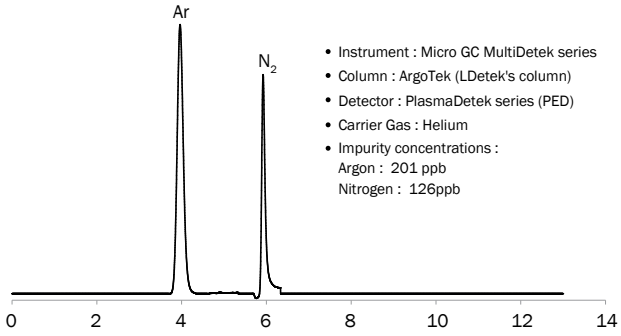
CHROMATOGRAM #16



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

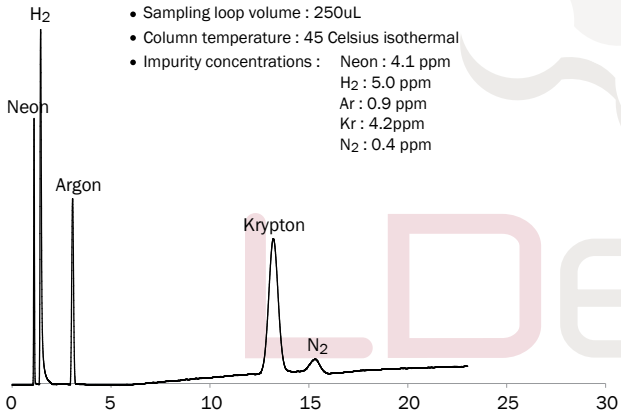
CHROMATOGRAM #17



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

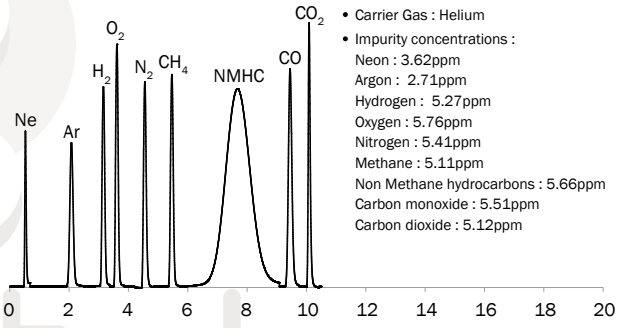
CHROMATOGRAM #18

- 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 : 20sccm
- Sampling loop volume : 250uL
- Column temperature : 45 Celsius isothermal
- Impurity concentrations : Neon : 4.1 ppm
  H_2 : 5.0 ppm
  Ar : 0.9 ppm
  Kr : 4.2ppm
  N_2 : 0.4 ppm



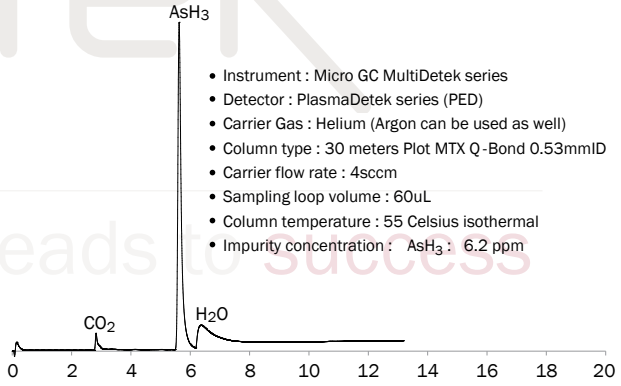
CHROMATOGRAM #19

- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium
- Impurity concentrations :
  Neon : 3.62ppm
  Argon : 2.71ppm
  Hydrogen : 5.27ppm
  Oxygen : 5.76ppm
  Nitrogen : 5.41ppm
  Methane : 5.11ppm
  Non Methane hydrocarbons : 5.66ppm
  Carbon monoxide : 5.51ppm
  Carbon dioxide : 5.12ppm

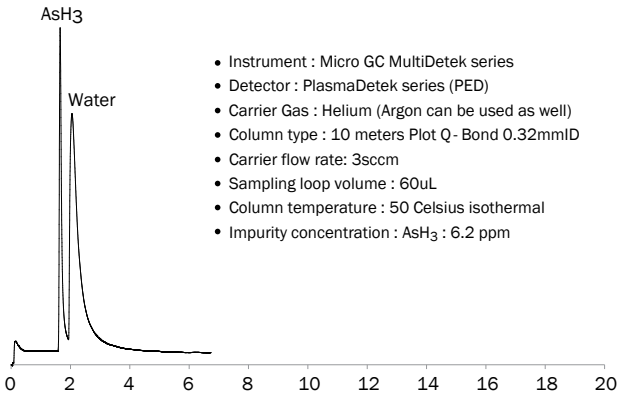


CHROMATOGRAM #21

- 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 : 55 Celsius isothermal
- Impurity concentration : AsH_3 : 6.2 ppm



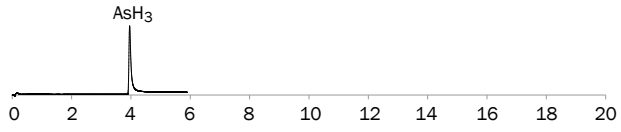
CHROMATOGRAM #20



- 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: 3sccm
- Sampling loop volume : 60uL
- Column temperature : 50 Celsius isothermal
- Impurity concentration : AsH_3 : 6.2 ppm

CHROMATOGRAM #22

- 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/Na_2SO_4
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 40 Celsius isothermal
- Impurity concentration : AsH_3 : 6.2 ppm



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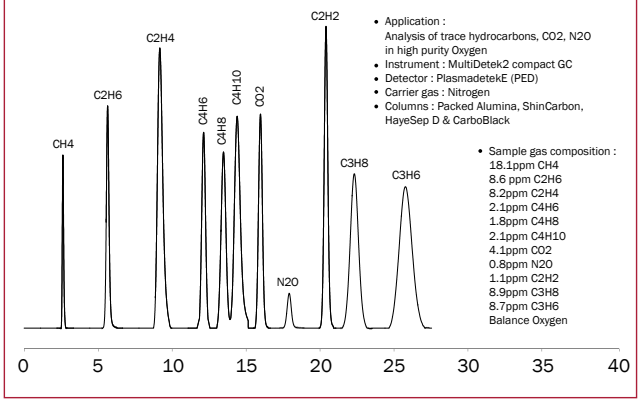
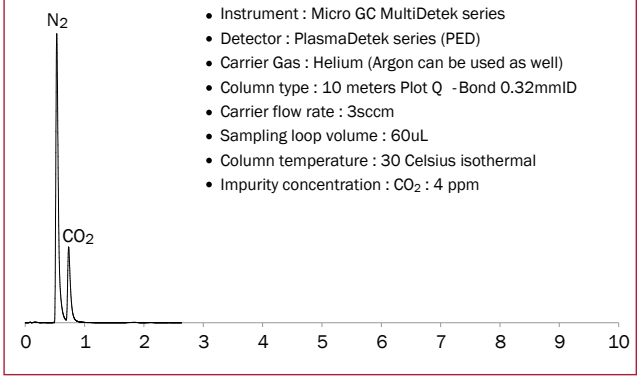
CHROMATOGRAM #23



- Application : Analysis of trace hydrocarbons, CO2, N2O in high purity Oxygen
- Instrument : MultiDetek2 compact GC
- Detector : PlasmadetekE (PED)
- Carrier gas : Nitrogen
- Columns : Packed Alumina, ShinCarbon, HayeSep D & CarboBlack

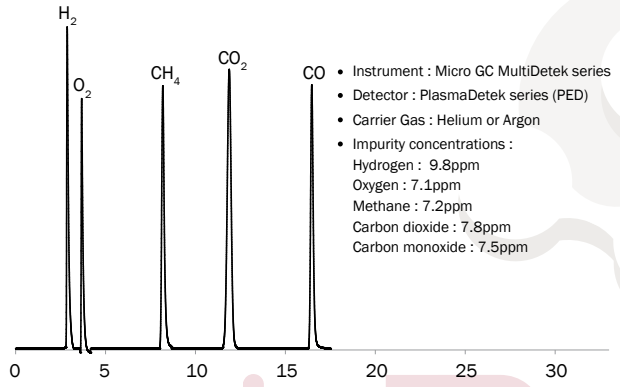
- Sample gas composition : 18.1ppm CH4
  8.6 ppm C2H6
  8.2ppm C2H4
  2.1ppm C4H6
  1.8ppm C4H8
  2.1ppm C4H10
  4.1ppm CO2
  0.8ppm N2O
  1.1ppm C2H2
  8.9ppm C3H8
  8.7ppm C3H6
  Balance Oxygen

CHROMATOGRAM #24



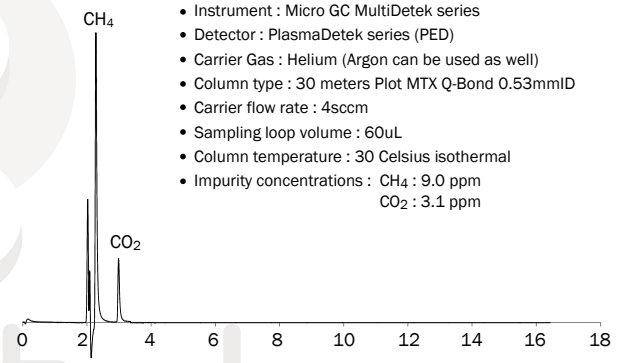
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 10 meters Plot Q -Bond 0.32mmID
- Carrier flow rate : 3sccm
- Sampling loop volume : 60uL
- Column temperature : 30 Celsius isothermal
- Impurity concentration : CO_2 : 4 ppm

CHROMATOGRAM #25



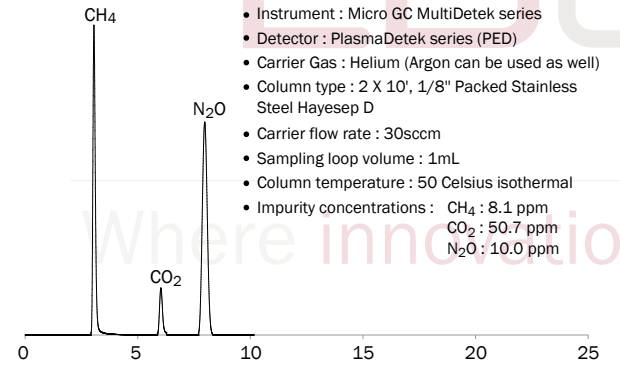
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium or Argon
- Impurity concentrations :
  Hydrogen : 9.8ppm
  Oxygen : 7.1ppm
  Methane : 7.2ppm
  Carbon dioxide : 7.8ppm
  Carbon monoxide : 7.5ppm

CHROMATOGRAM #26



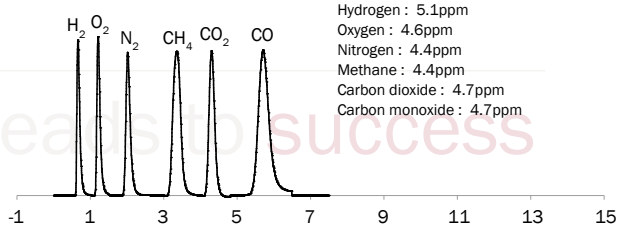
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 30 Celsius isothermal
- Impurity concentrations : CH_4 : 9.0 ppm
  CO_2 : 3.1 ppm

CHROMATOGRAM #27



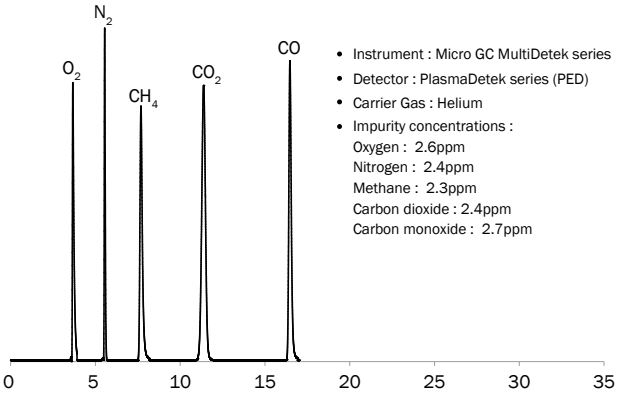
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 2 X 10', 1/8" Packed Stainless Steel Hayesep D
- Carrier flow rate : 30sccm
- Sampling loop volume : 1mL
- Column temperature : 50 Celsius isothermal
- Impurity concentrations : CH_4 : 8.1 ppm
  CO_2 : 50.7 ppm
  N_2O : 10.0 ppm

CHROMATOGRAM #30



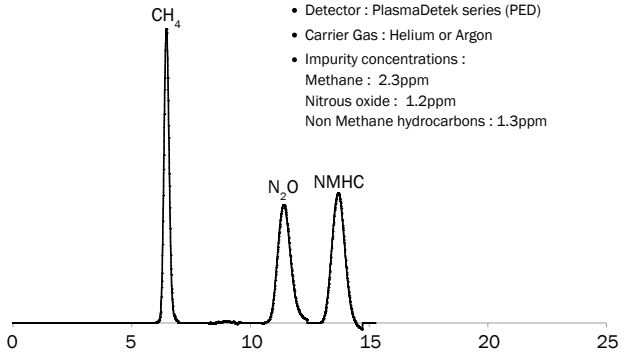
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon
- Impurity concentrations :
  Hydrogen : 5.1ppm
  Oxygen : 4.6ppm
  Nitrogen : 4.4ppm
  Methane : 4.4ppm
  Carbon dioxide : 4.7ppm
  Carbon monoxide : 4.7ppm

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

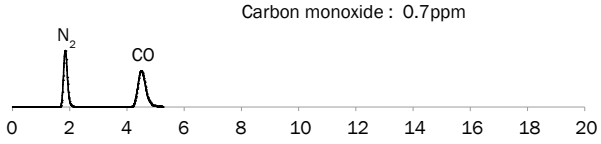


- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium or Argon
- Impurity concentrations :
  Methane : 2.3ppm
  Nitrous oxide : 1.2ppm
  Non Methane hydrocarbons : 1.3ppm

Where innovation leads to success

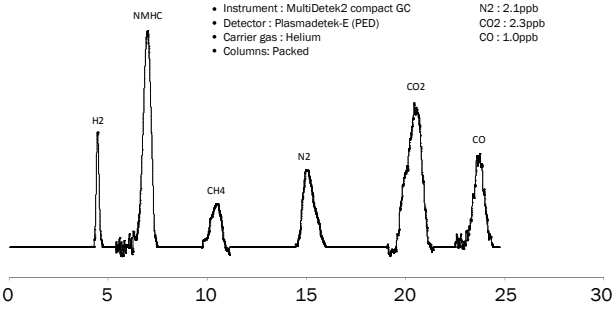
CHROMATOGRAM #33

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



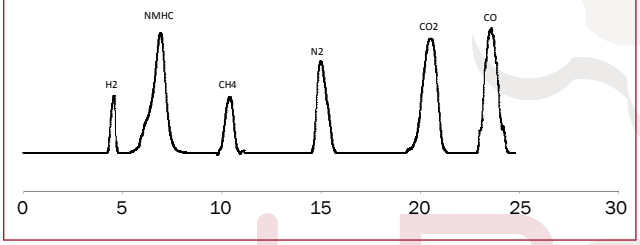
CHROMATOGRAM #34

- 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
- Columns: Packed
- Sample gas composition :
  H2 : 3.1ppb
  NMHC : 3.2ppb
  CH4 : 0.9ppb
  N2 : 2.1ppb
  CO2 : 2.3ppb
  CO : 1.0ppb



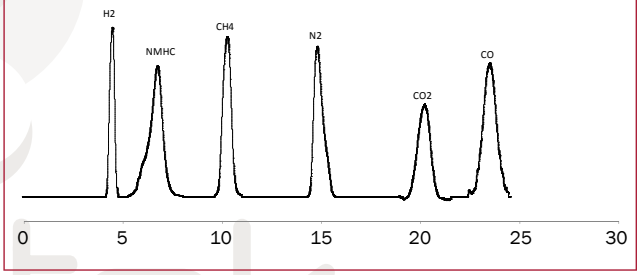
CHROMATOGRAM #35

- 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
- Columns: Packed
- Sample gas composition :
  H2= 7.5ppb
  NMHC : 9.1ppb
  CH4= 6.1ppb
  N2= 7.2 ppb
  CO2 =5.9ppb
  CO= 4.1ppb



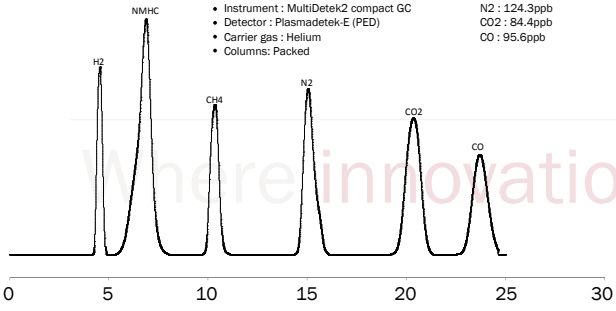
CHROMATOGRAM #36

- 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
- Columns: Packed
- Sample gas composition :
  H2 = 38.2ppb
  NMHC : 25.2ppb
  CH4 = 36.8 ppb
  N2 = 36.9 ppb
  CO2= 26.4 ppb
  CO= 36.4 ppb



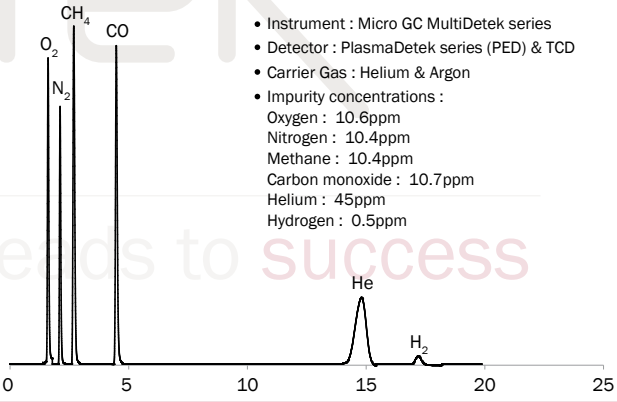
CHROMATOGRAM #37

- 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
- Columns: Packed
- Sample gas composition :
  H2 : 111.9ppb
  NMHC : 129.2ppb
  CH4 : 87.6ppb
  N2 : 124.3ppb
  CO2 : 84.4ppb
  CO : 95.6ppb



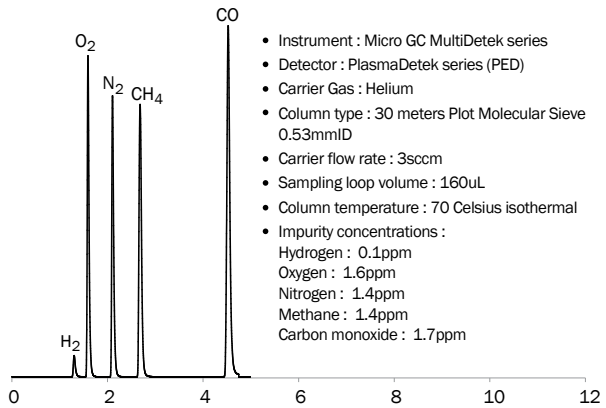
CHROMATOGRAM #38

- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED) & TCD
- Carrier Gas : Helium & Argon
- Impurity concentrations :
  Oxygen : 10.6ppm
  Nitrogen : 10.4ppm
  Methane : 10.4ppm
  Carbon monoxide : 10.7ppm
  Helium : 45ppm
  Hydrogen : 0.5ppm



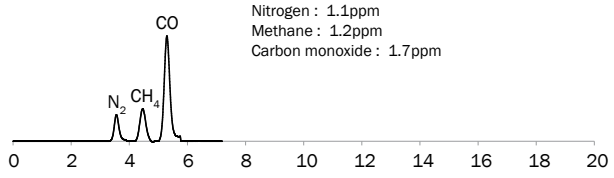
CHROMATOGRAM #39

- 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



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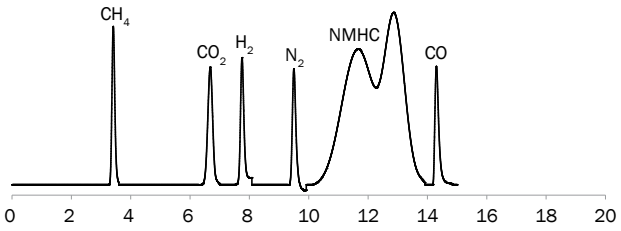
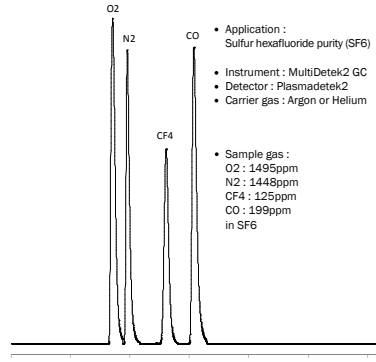
CHROMATOGRAM #41

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

- Impurity concentrations :
  Methane : 5.38ppm
  Carbon dioxide : 4.12ppm
  Hydrogen : 4.73ppm
  Nitrogen : 5.86ppm
  Non Methane hydrocarbons : 5.38ppm
  Carbon monoxide : 4.92ppm

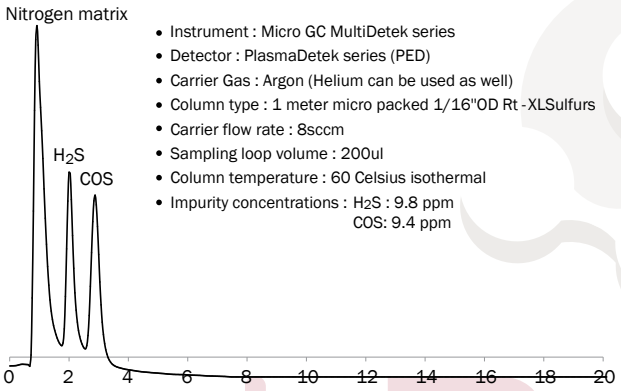


CHROMATOGRAM #42



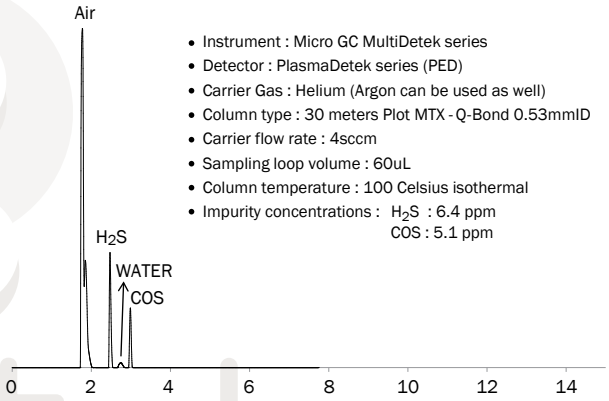
- Application :
  Sulfur hexafluoride purity (SF6)
- Instrument : MultiDetek2 GC
- Detector : Plasmadetek2
- Carrier gas : Argon or Helium
- Sample gas :
  O2 : 1495ppm
  N2 : 1448ppm
  CF4 : 125ppm
  CO : 199ppm
  in SF6

CHROMATOGRAM #43



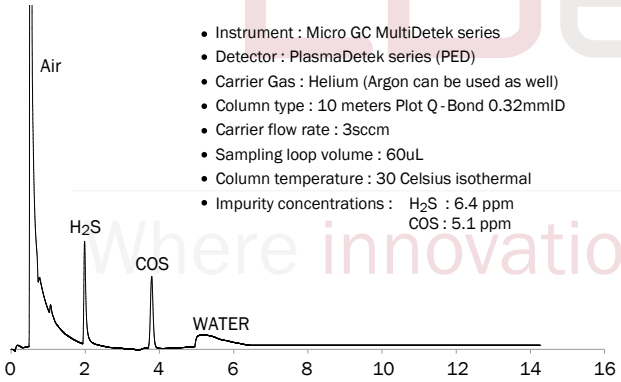
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon (Helium can be used as well)
- Column type : 1 meter micro packed 1/16"OD Rt-XLSulfurs
- Carrier flow rate : 8sccm
- Sampling loop volume : 200ul
- Column temperature : 60 Celsius isothermal
- Impurity concentrations : H_2S : 9.8 ppm
  COS: 9.4 ppm

CHROMATOGRAM #44



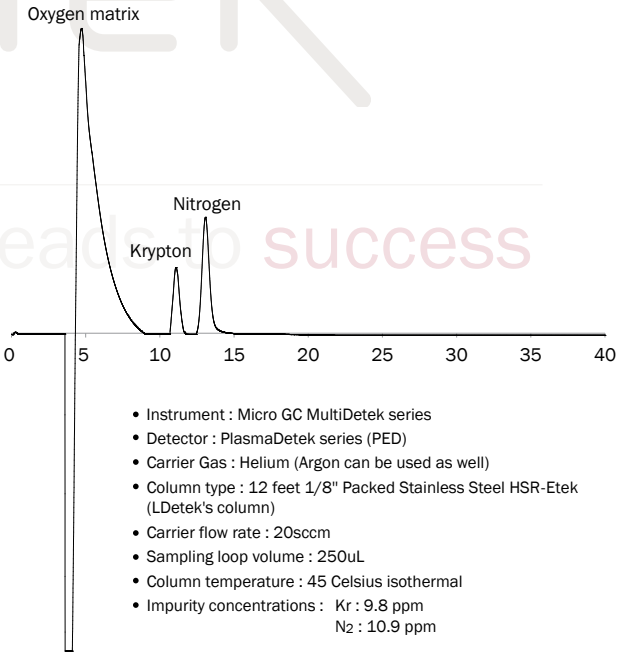
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meters Plot MTX-Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 100 Celsius isothermal
- Impurity concentrations : H_2S : 6.4 ppm
  COS : 5.1 ppm

CHROMATOGRAM #45



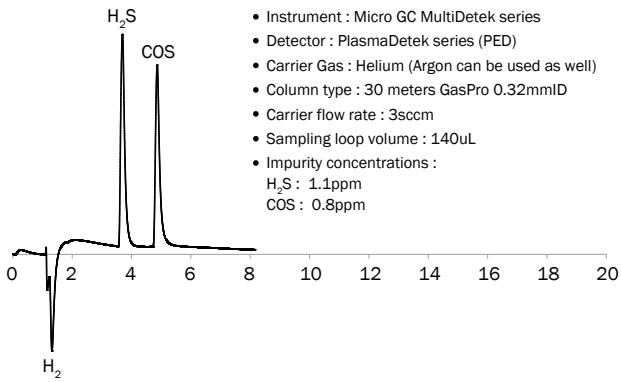
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 10 meters Plot Q-Bond 0.32mmID
- Carrier flow rate : 3sccm
- Sampling loop volume : 60uL
- Column temperature : 30 Celsius isothermal
- Impurity concentrations : H_2S : 6.4 ppm
  COS : 5.1 ppm

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
  N_2 : 10.9 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 :
  H_2S : 1.1ppm
  COS : 0.8ppm

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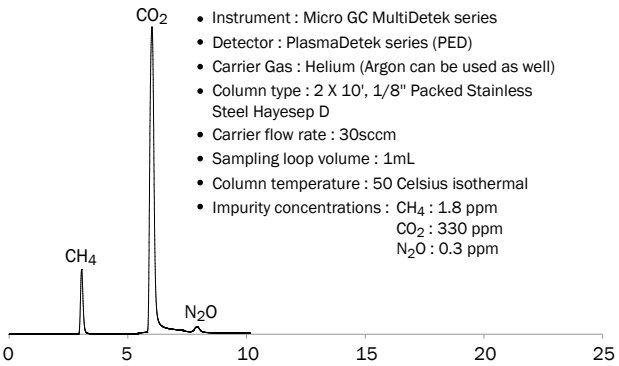
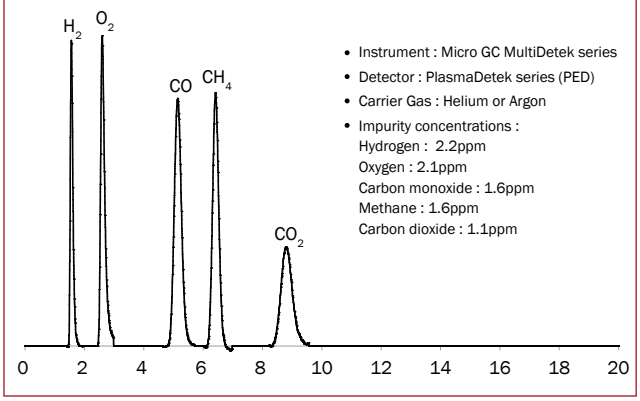
CHROMATOGRAM #48



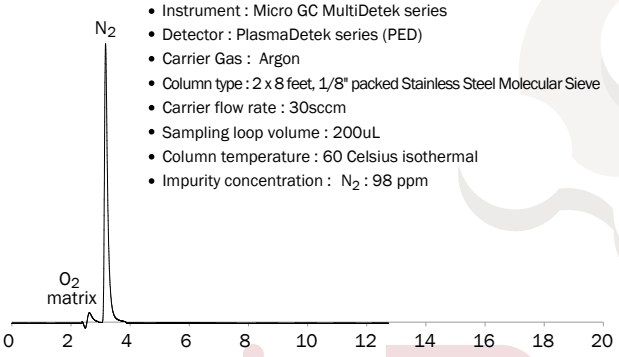
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 2 X 10', 1/8" Packed Stainless Steel Hayesep D
- Carrier flow rate : 30sccm
- Sampling loop volume : 1mL
- Column temperature : 50 Celsius isothermal
- Impurity concentrations : CH_4 : 1.8 ppm
  CO_2 : 330 ppm
  N_2O : 0.3 ppm

CHROMATOGRAM #49



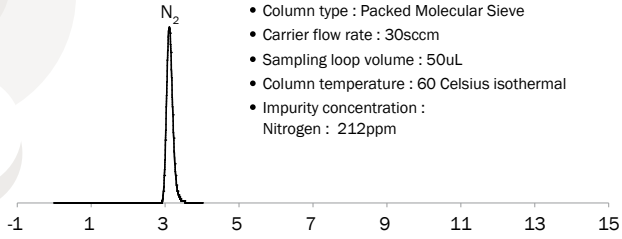
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium or Argon
- Impurity concentrations :
  Hydrogen : 2.2ppm
  Oxygen : 2.1ppm
  Carbon monoxide : 1.6ppm
  Methane : 1.6ppm
  Carbon dioxide : 1.1ppm

CHROMATOGRAM #52



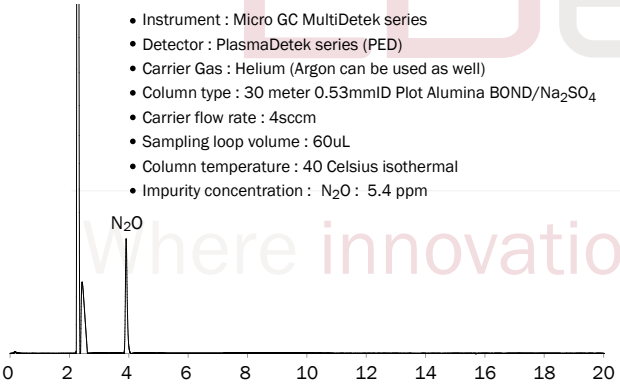
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon
- Column type : 2 x 8 feet, 1/8" packed Stainless Steel Molecular Sieve
- Carrier flow rate : 30sccm
- Sampling loop volume : 200uL
- Column temperature : 60 Celsius isothermal
- Impurity concentration : N_2 : 98 ppm

CHROMATOGRAM #53



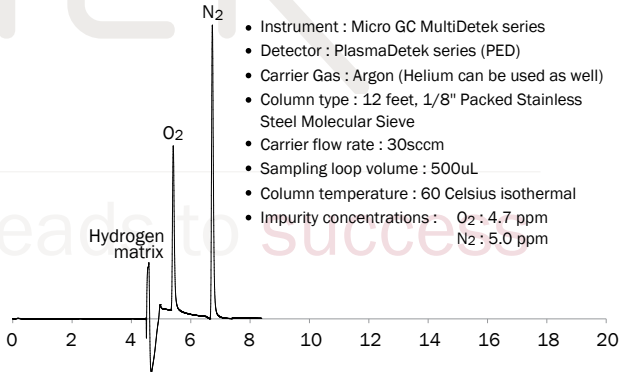
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon
- Column type : Packed Molecular Sieve
- Carrier flow rate : 30sccm
- Sampling loop volume : 50uL
- Column temperature : 60 Celsius isothermal
- Impurity concentration :
  Nitrogen : 212ppm

CHROMATOGRAM #54



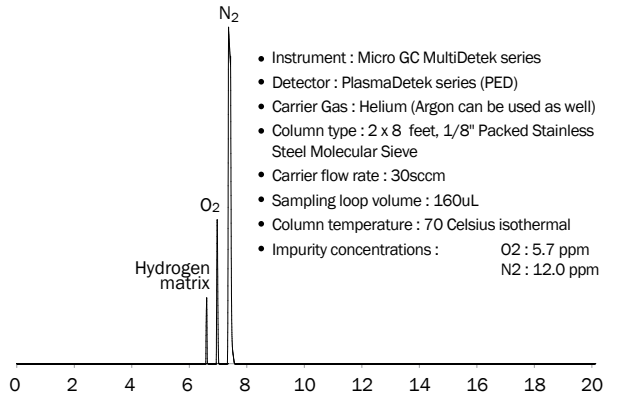
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meter 0.53mmID Plot Alumina BOND/Na_2SO_4
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 40 Celsius isothermal
- Impurity concentration : N_2O : 5.4 ppm

CHROMATOGRAM #56



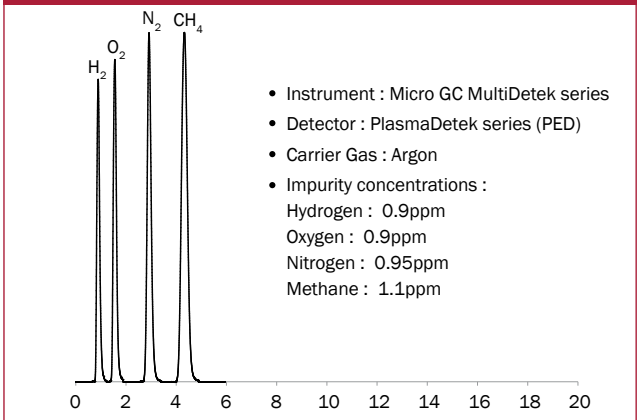
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon (Helium can be used as well)
- Column type : 12 feet, 1/8" Packed Stainless Steel Molecular Sieve
- Carrier flow rate : 30sccm
- Sampling loop volume : 500uL
- Column temperature : 60 Celsius isothermal
- Impurity concentrations : O_2 : 4.7 ppm
  N_2 : 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

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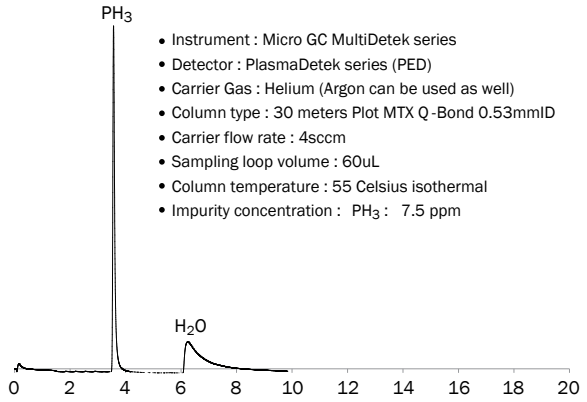
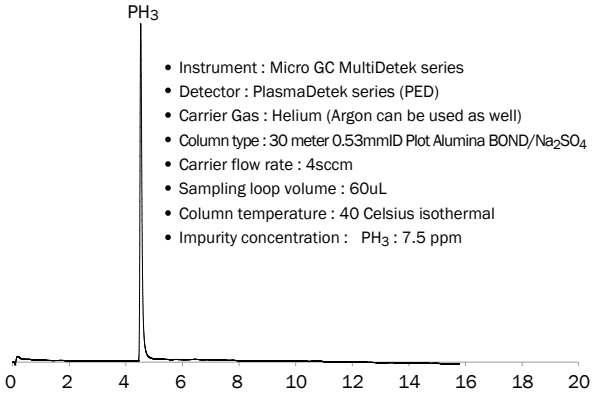
CHROMATOGRAM #59



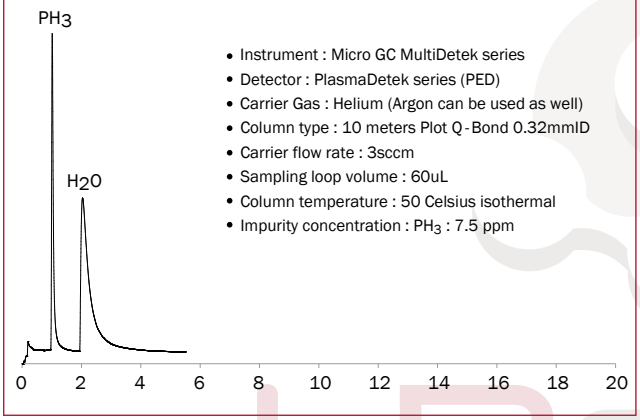
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 55 Celsius isothermal
- Impurity concentration : PH_3 : 7.5 ppm

CHROMATOGRAM #60



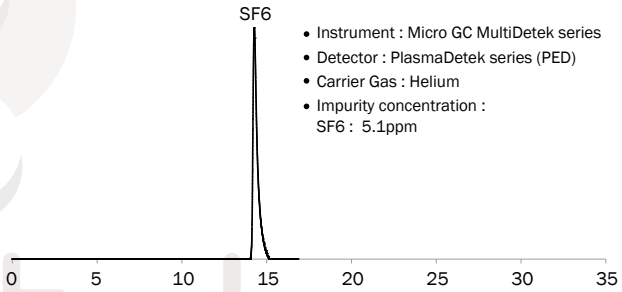
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meter 0.53mmID Plot Alumina BOND/Na_2SO_4
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 40 Celsius isothermal
- Impurity concentration : PH_3 : 7.5 ppm

CHROMATOGRAM #61



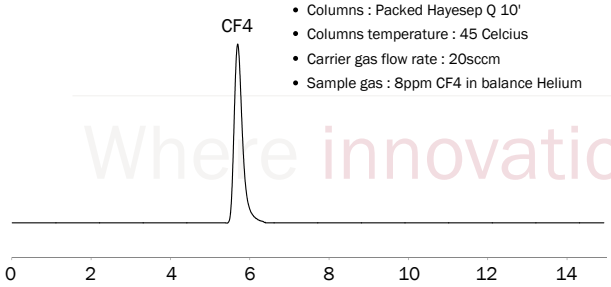
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 10 meters Plot Q-Bond 0.32mmID
- Carrier flow rate : 3sccm
- Sampling loop volume : 60uL
- Column temperature : 50 Celsius isothermal
- Impurity concentration : PH_3 : 7.5 ppm

CHROMATOGRAM #62



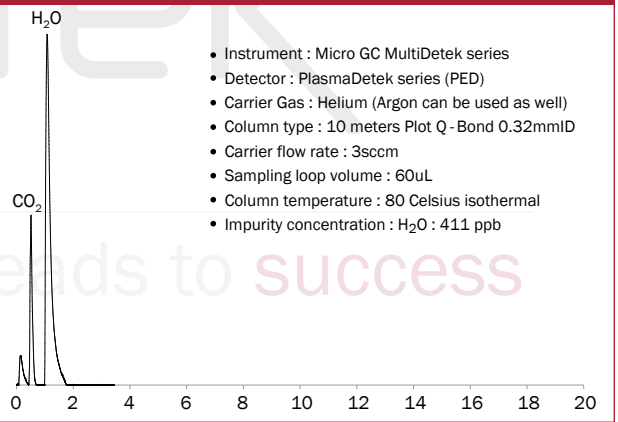
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium
- Impurity concentration : SF6 : 5.1ppm

CHROMATOGRAM #63



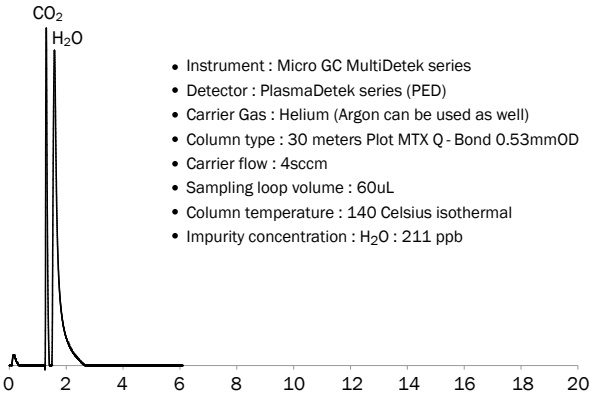
- Instrument : MultiDetek2 GC
- Detector : Plasmadetek2
- Carrier gas : Helium
- Columns : Packed Hayesep Q 10'
- Columns temperature : 45 Celcius
- Carrier gas flow rate : 20sccm
- Sample gas : 8ppm CF4 in balance Helium

CHROMATOGRAM #64



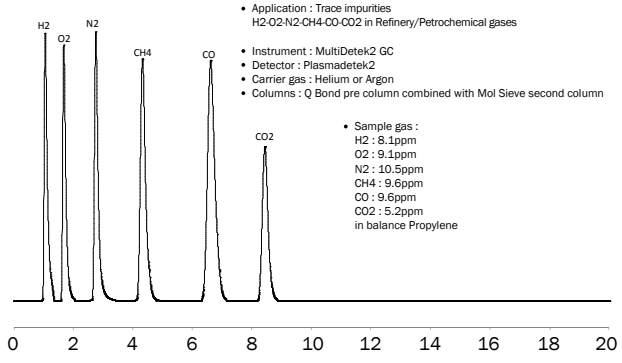
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 10 meters Plot Q-Bond 0.32mmID
- Carrier flow rate : 3sccm
- Sampling loop volume : 60uL
- Column temperature : 80 Celsius isothermal
- Impurity concentration : H_2O : 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 0.53mmOD
- Carrier flow : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 140 Celsius isothermal
- Impurity concentration : H_2O : 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 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

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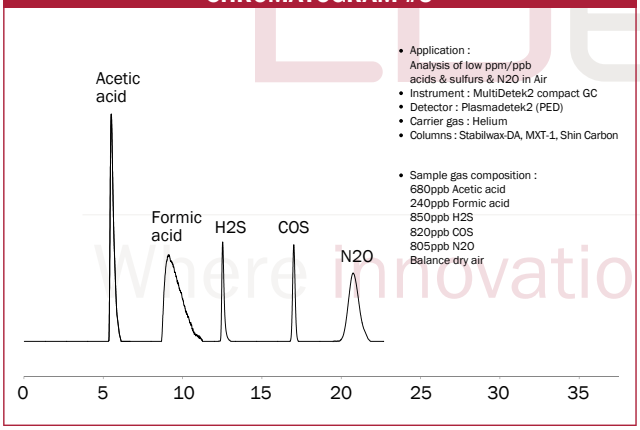
SAMPLE

Chromatograms #

Air **5-10-44-45-48**
Argon **30-54-58**
Crude Argon **52-53**
Ethylene **66**
Helium **19-39**
Hydrogen **15-31-40-46-56-57**
Hydrogen Chloride **25**
Natural gas **50-51**
Neon **38**
Nitrogen **9-13-16-32-43-49**
Oxygen **11-14-17-23-33-34-35-36-37-41-47**
Propylene **66**
Sulfur hexafluoride **42-63**
Syngas **44-45**
Xenon **62**

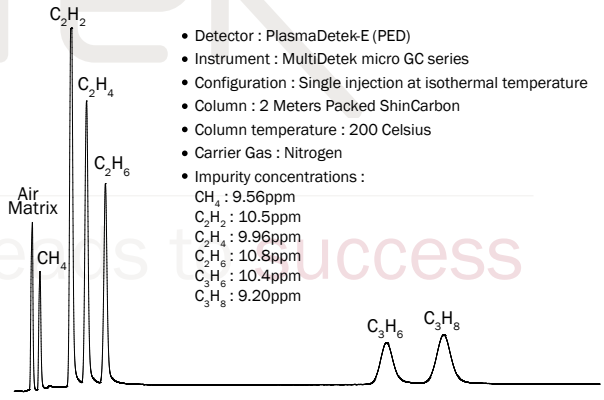
CHROMATOGRAM #5



- 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

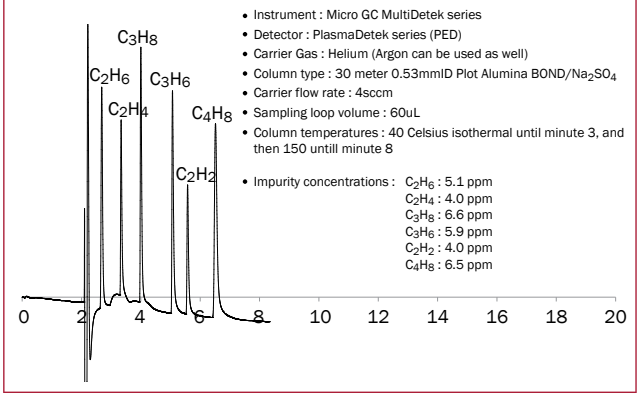
- Sample gas composition : 680ppb Acetic acid 240ppb Formic acid 850ppb H2S 820ppb COS 805ppb N2O Balance dry air

CHROMATOGRAM #10



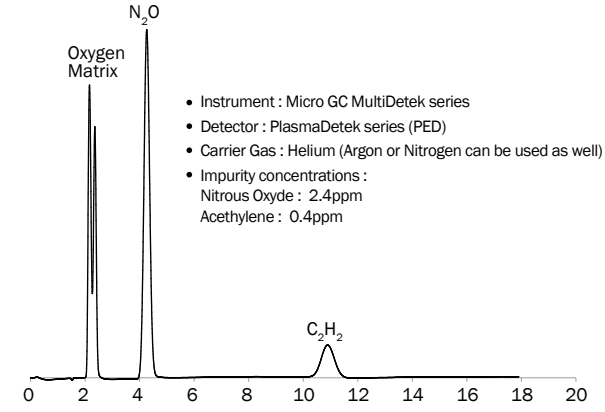
- Detector : PlasmaDetek-E (PED)
- Instrument : MultiDetek micro GC series
- Configuration : Single injection at isothermal temperature
- Column : 2 Meters Packed ShinCarbon
- Column temperature : 200 Celsius
- Carrier Gas : Nitrogen
- Impurity concentrations : CH_4 : 9.56ppm, C_2H_2 : 10.5ppm, C_2H_4 : 9.96ppm, C_2H_6 : 10.8ppm, C_3H_6 : 10.4ppm, C_3H_8 : 9.20ppm

CHROMATOGRAM #9



- 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/Na_2SO_4
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperatures : 40 Celsius isothermal until minute 3, and then 150 untill minute 8
- Impurity concentrations : C_2H_6 : 5.1 ppm, C_2H_4 : 4.0 ppm, C_3H_8 : 6.6 ppm, C_3H_6 : 5.9 ppm, C_2H_2 : 4.0 ppm, C_4H_8 : 6.5 ppm

CHROMATOGRAM #11



- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon or Nitrogen can be used as well)
- Impurity concentrations : Nitrous Oxyde : 2.4ppm, Acethylene : 0.4ppm

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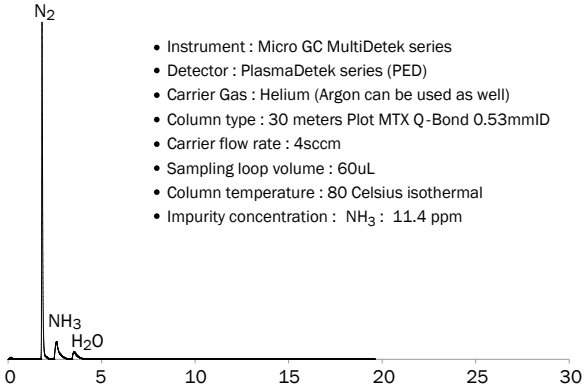
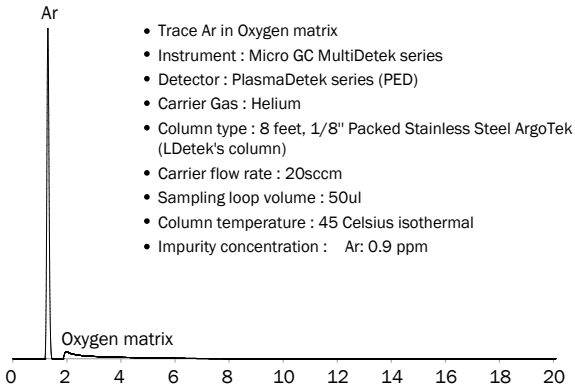
CHROMATOGRAM #13



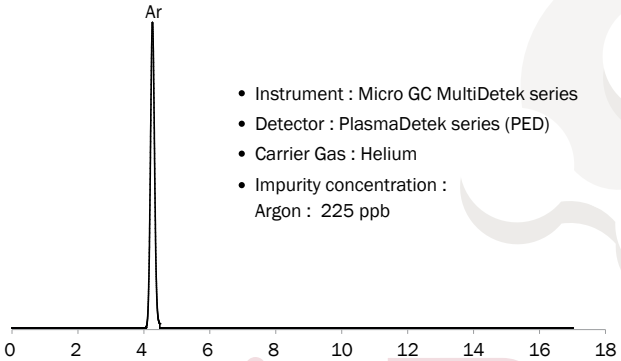
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 80 Celsius isothermal
- Impurity concentration : NH_3 : 11.4 ppm

CHROMATOGRAM #14



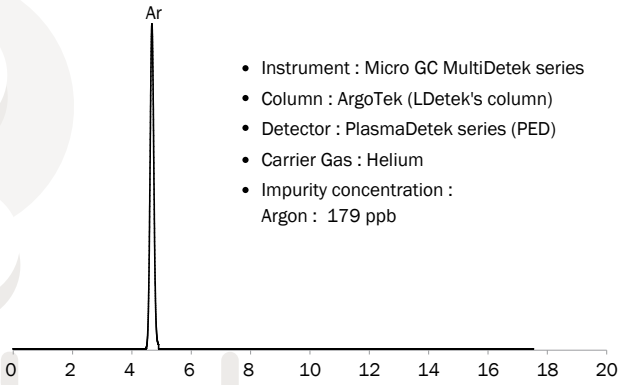
- Trace Ar in Oxygen matrix
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium
- Column type : 8 feet, 1/8" Packed Stainless Steel ArgoTek (LDetek's column)
- Carrier flow rate : 20sccm
- Sampling loop volume : 50ul
- Column temperature : 45 Celsius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

CHROMATOGRAM #15



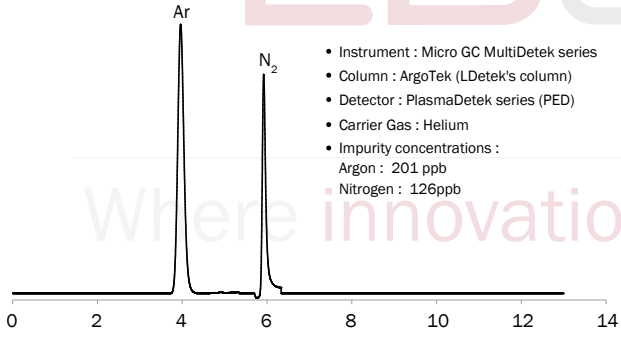
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium
- Impurity concentration : Argon : 225 ppb

CHROMATOGRAM #16



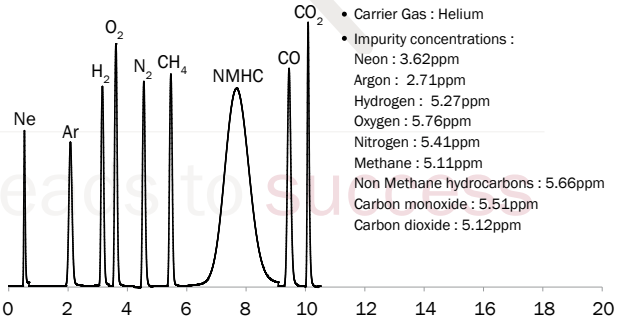
- Instrument : Micro GC MultiDetek series
- Column : ArgoTek (LDetek's column)
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium
- Impurity concentration : Argon : 179 ppb

CHROMATOGRAM #17



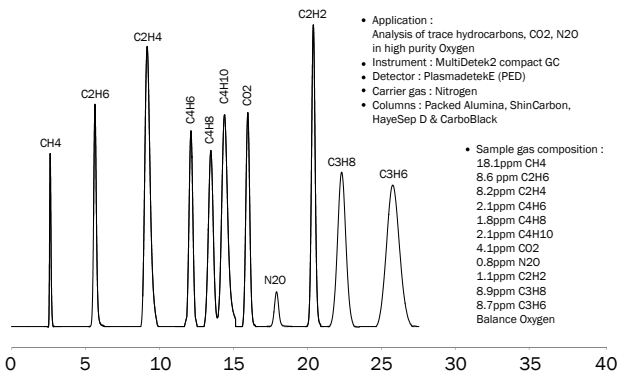
- Instrument : Micro GC MultiDetek series
- Column : ArgoTek (LDetek's column)
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium
- Impurity concentrations : Argon : 201 ppb Nitrogen : 126ppb

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 : 5.76ppm
  Nitrogen : 5.41ppm
  Methane : 5.11ppm
  Non Methane hydrocarbons : 5.66ppm
  Carbon monoxide : 5.51ppm
  Carbon dioxide : 5.12ppm

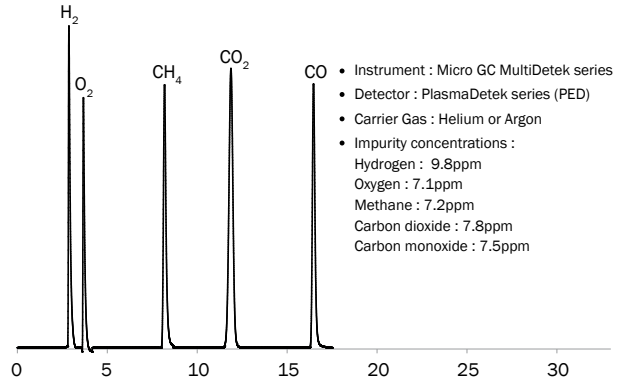
CHROMATOGRAM #23



- Application : Analysis of trace hydrocarbons, CO2, N2O in high purity Oxygen
- Instrument : MultiDetek2 compact GC
- Detector : PlasmadetekE (PED)
- Carrier gas : Nitrogen
- Columns : Packed Alumina, ShinCarbon, HayeSep D & CarboBlack

- Sample gas composition :
  18.1ppm CH4
  8.6 ppm C2H6
  8.2ppm C2H4
  2.1ppm C4H6
  1.8ppm C4H8
  2.1ppm C4H10
  4.1ppm CO2
  0.8ppm N2O
  1.1ppm C2H2
  8.9ppm C3H8
  8.7ppm 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 : 7.8ppm
  Carbon monoxide : 7.5ppm

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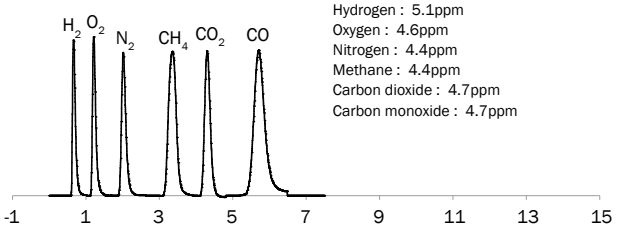
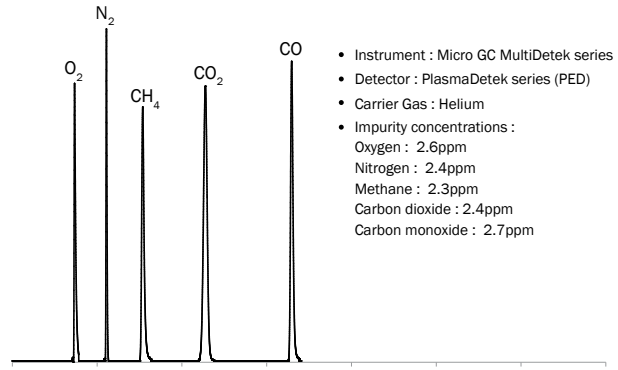
CHROMATOGRAM #30



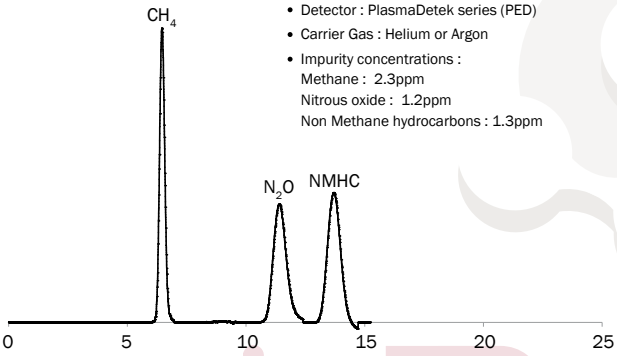
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon
- Impurity concentrations :
  Hydrogen : 5.1ppm
  Oxygen : 4.6ppm
  Nitrogen : 4.4ppm
  Methane : 4.4ppm
  Carbon dioxide : 4.7ppm
  Carbon monoxide : 4.7ppm

CHROMATOGRAM #31



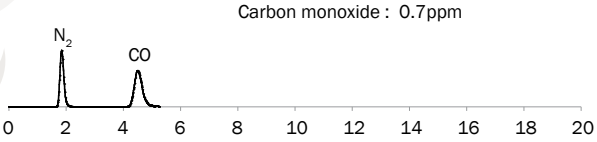
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium
- Impurity concentrations :
  Oxygen : 2.6ppm
  Nitrogen : 2.4ppm
  Methane : 2.3ppm
  Carbon dioxide : 2.4ppm
  Carbon monoxide : 2.7ppm

CHROMATOGRAM #32



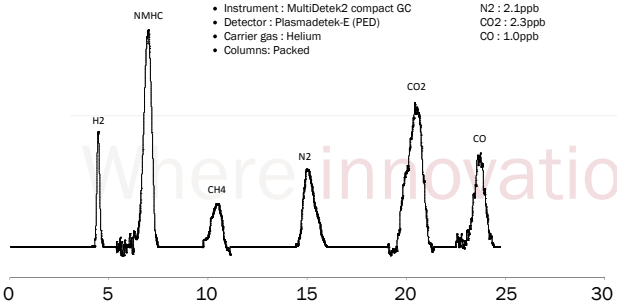
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium or Argon
- Impurity concentrations :
  Methane : 2.3ppm
  Nitrous oxide : 1.2ppm
  Non Methane hydrocarbons : 1.3ppm

CHROMATOGRAM #33



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

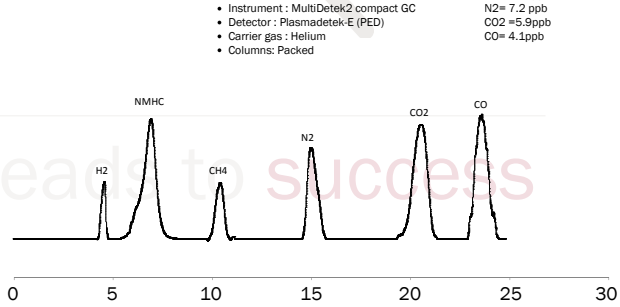
CHROMATOGRAM #34



- 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
- Columns: Packed

- Sample gas composition :
  H2 : 3.1ppb
  NMHC : 3.2ppb
  CH4 : 0.9ppb
  N2 : 2.1ppb
  CO2 : 2.3ppb
  CO : 1.0ppb

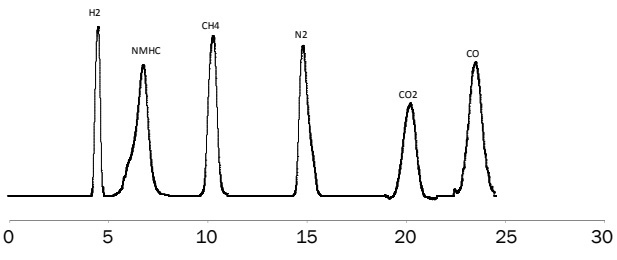
CHROMATOGRAM #35



- 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
- Columns: Packed

- Sample gas composition :
  H2= 7.5ppb
  NMHC : 9.1ppb
  CH4= 6.1ppb
  N2= 7.2 ppb
  CO2 =5.9ppb
  CO= 4.1ppb

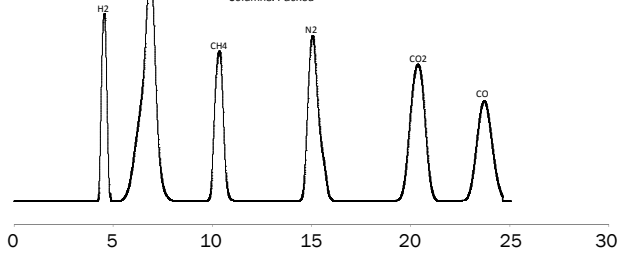
CHROMATOGRAM #36



- 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
- Columns: Packed

- Sample gas composition :
  H2 = 38.2ppb
  NMHC : 25.2ppb
  CH4 = 36.8 ppb
  N2 = 36.9 ppb
  CO2= 26.4 ppb
  CO= 36.4 ppb

CHROMATOGRAM #37



- 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
- Columns: Packed

- Sample gas composition :
  H2 : 111.9ppb
  NMHC : 129.2ppb
  CH4 : 87.6ppb
  N2 : 124.3ppb
  CO2 : 84.4ppb
  CO : 95.6ppb

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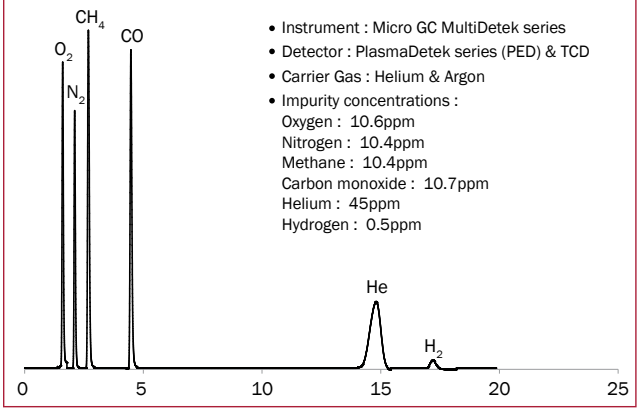
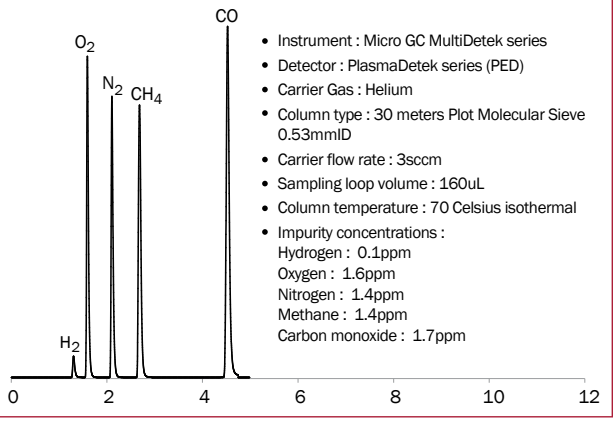
CHROMATOGRAM #38



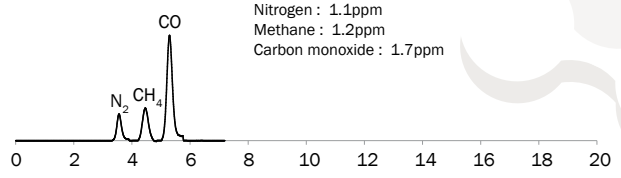
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED) & TCD
- Carrier Gas : Helium & Argon
- Impurity concentrations :
  Oxygen : 10.6ppm
  Nitrogen : 10.4ppm
  Methane : 10.4ppm
  Carbon monoxide : 10.7ppm
  Helium : 45ppm
  Hydrogen : 0.5ppm

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

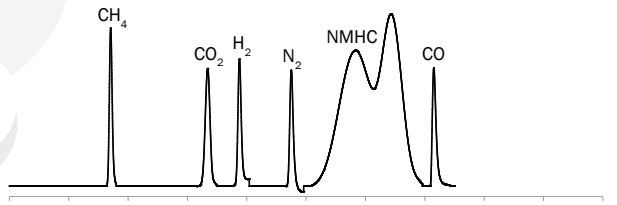
CHROMATOGRAM #40



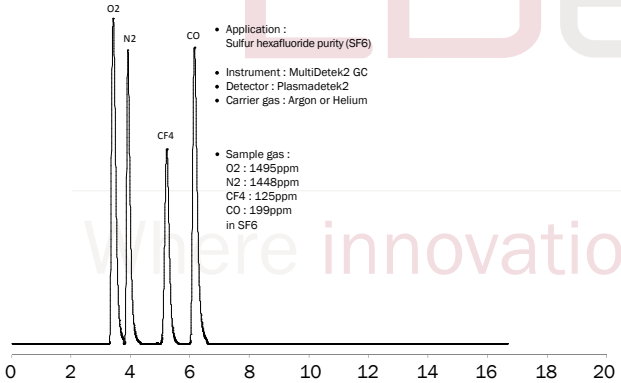
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon
- Impurity concentrations :
  Nitrogen : 1.1ppm
  Methane : 1.2ppm
  Carbon monoxide : 1.7ppm

CHROMATOGRAM #41

- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium or Argon
- Impurity concentrations :
  Methane : 5.38ppm
  Carbon dioxide : 4.12ppm
  Hydrogen : 4.73ppm
  Nitrogen : 5.86ppm
  Non Methane hydrocarbons : 5.38ppm
  Carbon monoxide : 4.92ppm

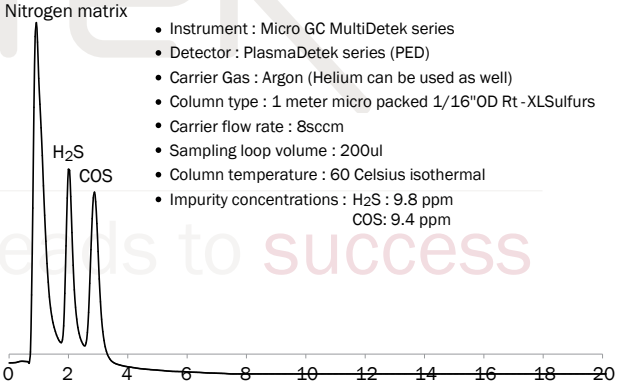


CHROMATOGRAM #42



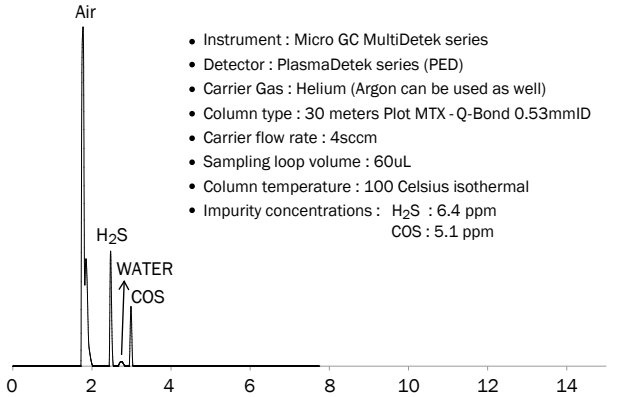
- Application :
  Sulfur hexafluoride purity (SF6)
- Instrument : MultiDetek2 GC
- Detector : Plasmadetek2
- Carrier gas : Argon or Helium
- Sample gas :
  O2 : 1495ppm
  N2 : 1448ppm
  CF4 : 125ppm
  CO : 199ppm
  in SF6

CHROMATOGRAM #43



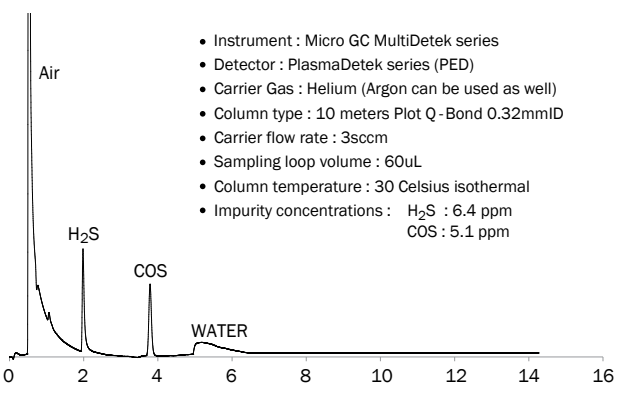
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon (Helium can be used as well)
- Column type : 1 meter micro packed 1/16"OD Rt-XLSulfurs
- Carrier flow rate : 8sccm
- Sampling loop volume : 200ul
- Column temperature : 60 Celsius isothermal
- Impurity concentrations : H_2S : 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-Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 100 Celsius isothermal
- Impurity concentrations : H_2S : 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 : H_2S : 6.4 ppm
  COS : 5.1 ppm

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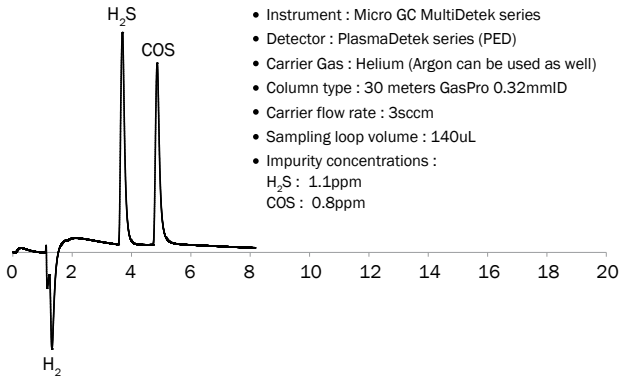
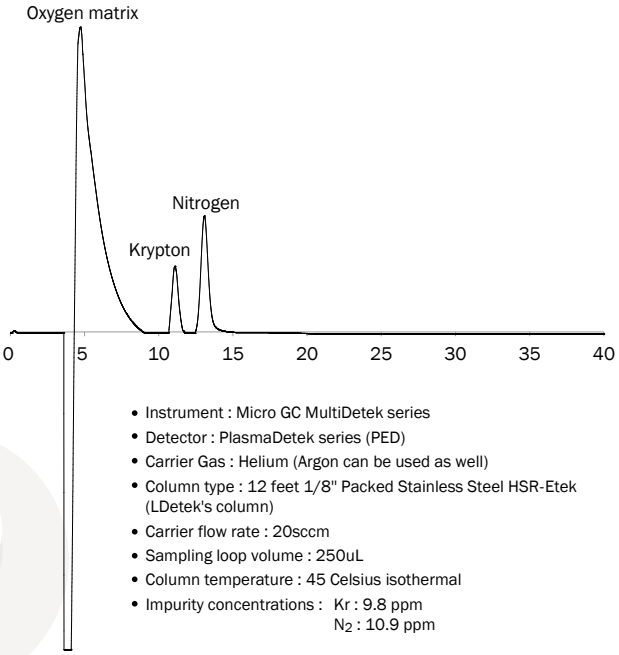
CHROMATOGRAM #46



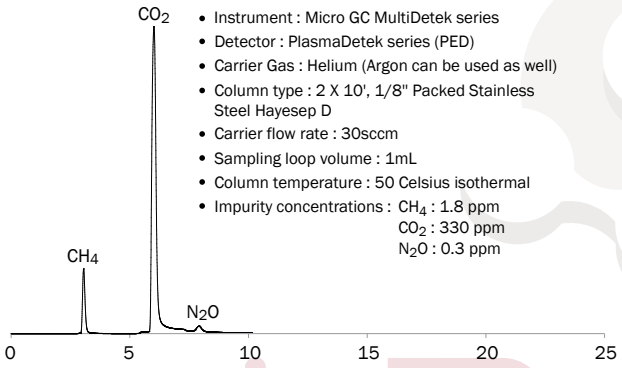
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meters GasPro 0.32mmID
- Carrier flow rate : 3sccm
- Sampling loop volume : 140uL
- Impurity concentrations :
  H_2S : 1.1ppm
  COS : 0.8ppm

CHROMATOGRAM #47



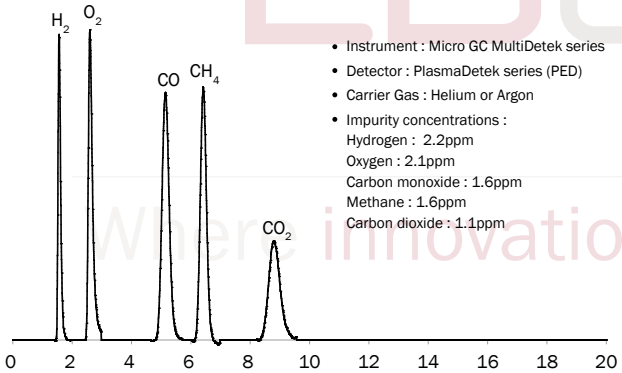
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 12 feet 1/8" Packed Stainless Steel HSR-Etek (LDetek's column)
- Carrier flow rate : 20sccm
- Sampling loop volume : 250uL
- Column temperature : 45 Celsius isothermal
- Impurity concentrations : Kr : 9.8 ppm
  N_2 : 10.9 ppm

CHROMATOGRAM #48



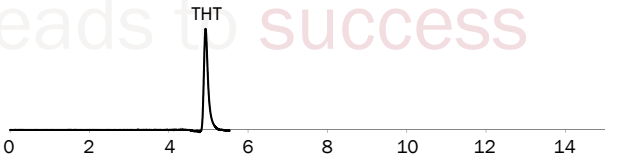
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 2 X 10', 1/8" Packed Stainless Steel Hayesep D
- Carrier flow rate : 30sccm
- Sampling loop volume : 1mL
- Column temperature : 50 Celsius isothermal
- Impurity concentrations : CH_4 : 1.8 ppm
  CO_2 : 330 ppm
  N_2O : 0.3 ppm

CHROMATOGRAM #49



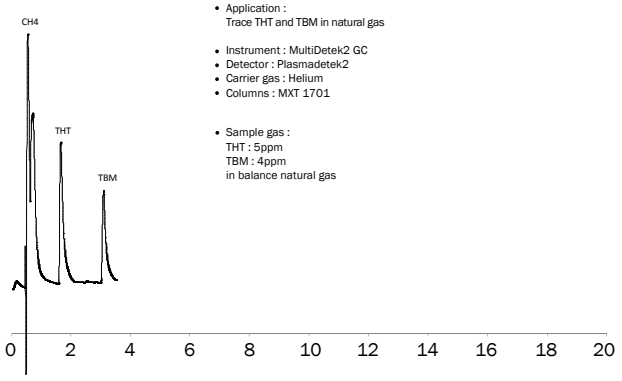
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium or Argon
- Impurity concentrations :
  Hydrogen : 2.2ppm
  Oxygen : 2.1ppm
  Carbon monoxide : 1.6ppm
  Methane : 1.6ppm
  Carbon dioxide : 1.1ppm

CHROMATOGRAM #50



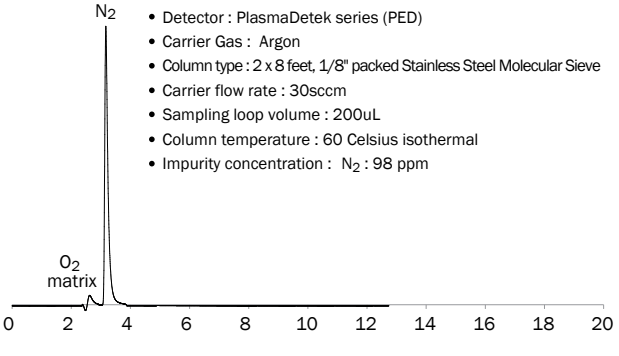
- Instrument : MultiDetek2 GC
- Detector : Plasmadetek2
- Carrier gas : Helium
- Columns : 2 x 15 meters, 0.53mmID MXT-1701
- Columns temperature : 75 Celcius
- Carrier gas flow rate : 5sccm
- Sample gas : 10ppm THT in balance Helium

CHROMATOGRAM #51



- Application :
  Trace THT and TBM in natural gas
- Instrument : MultiDetek2 GC
- Detector : Plasmadetek2
- Carrier gas : Helium
- Columns : MXT 1701
- Sample gas :
  THT : 5ppm
  TBM : 4ppm
  in balance natural gas

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 : N_2 : 98 ppm

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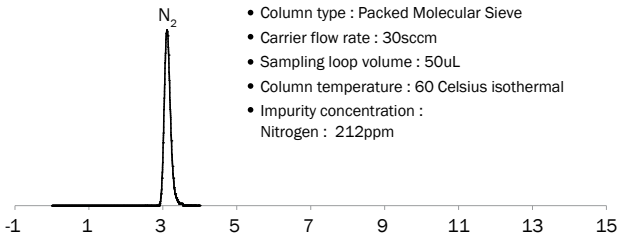
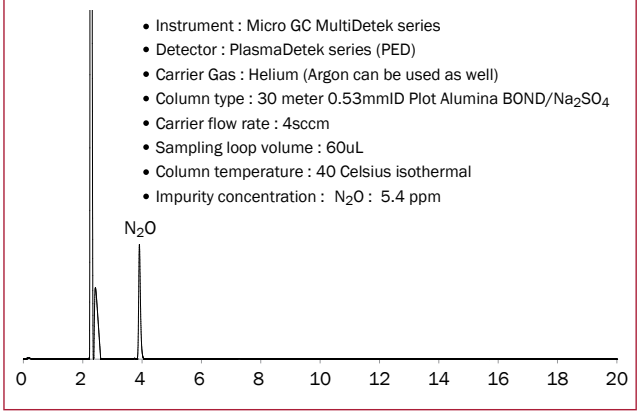
CHROMATOGRAM #53



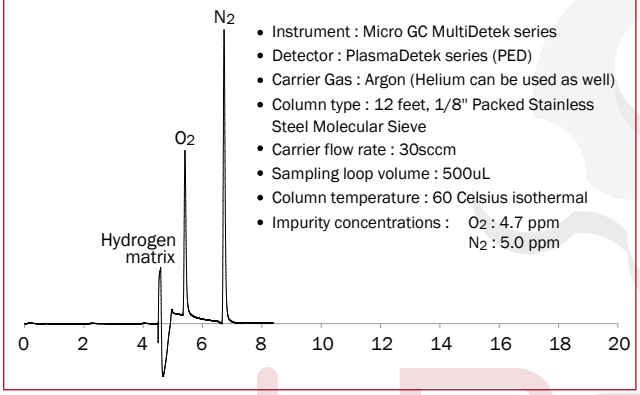
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon
- Column type : Packed Molecular Sieve
- Carrier flow rate : 30sccm
- Sampling loop volume : 50uL
- Column temperature : 60 Celsius isothermal
- Impurity concentration :
  Nitrogen : 212ppm

CHROMATOGRAM #54



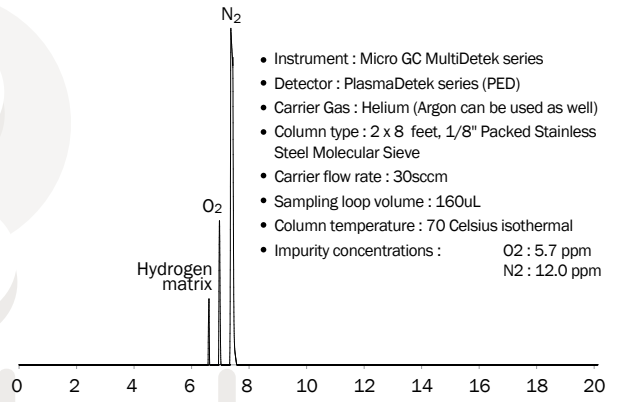
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 30 meter 0.53mmID Plot Alumina BOND/Na_2SO_4
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 40 Celsius isothermal
- Impurity concentration : N_2O : 5.4 ppm

CHROMATOGRAM #56



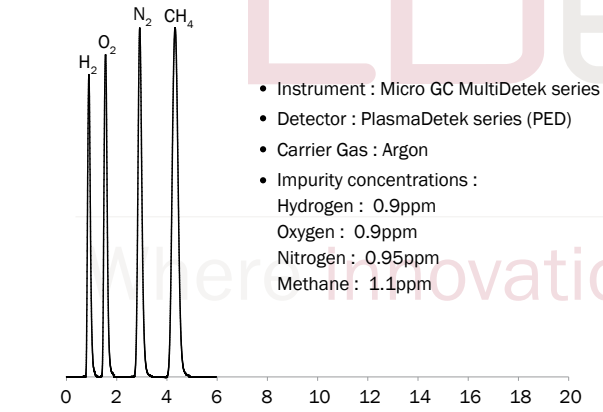
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon (Helium can be used as well)
- Column type : 12 feet, 1/8" Packed Stainless Steel Molecular Sieve
- Carrier flow rate : 30sccm
- Sampling loop volume : 500uL
- Column temperature : 60 Celsius isothermal
- Impurity concentrations : O_2 : 4.7 ppm
  N_2 : 5.0 ppm

CHROMATOGRAM #57



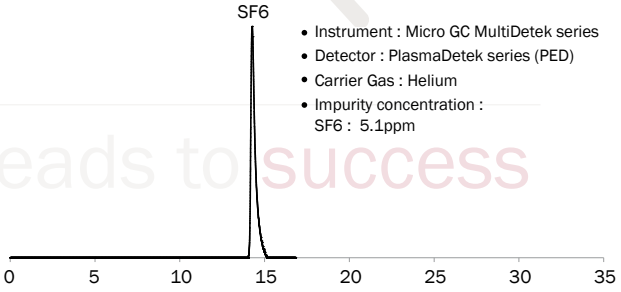
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Column type : 2 x 8 feet, 1/8" Packed Stainless Steel Molecular Sieve
- Carrier flow rate : 30sccm
- Sampling loop volume : 160uL
- Column temperature : 70 Celsius isothermal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

CHROMATOGRAM #58



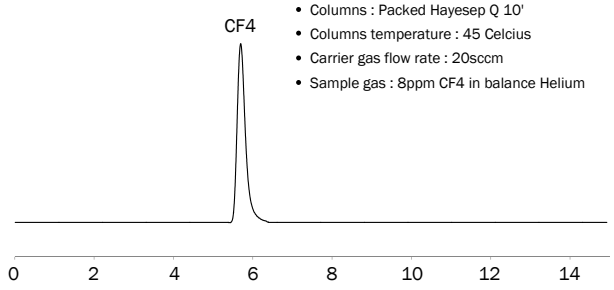
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon
- Impurity concentrations :
  Hydrogen : 0.9ppm
  Oxygen : 0.9ppm
  Nitrogen : 0.95ppm
  Methane : 1.1ppm

CHROMATOGRAM #62



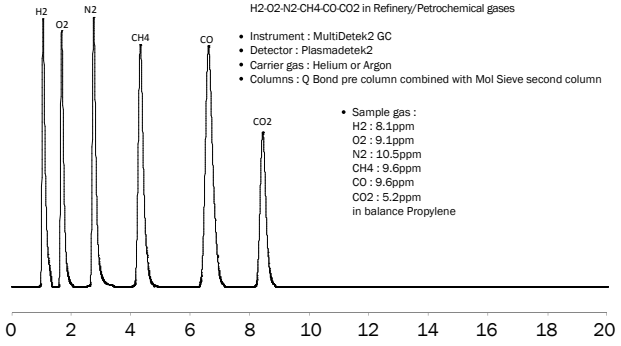
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium
- Impurity concentration :
  SF6 : 5.1ppm

CHROMATOGRAM #63



- Instrument : MultiDetek2 GC
- Detector : Plasmadetek2
- Carrier gas : Helium
- Columns : Packed Hayesep Q 10'
- Columns temperature : 45 Celcius
- Carrier gas flow rate : 20sccm
- Sample gas : 8ppm CF4 in balance Helium

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 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

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PLASMADETEK 2

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:

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Phone: 418 755-1319 • Fax: 418 755-1329 • **info@ldetek.com** • **www.ldetek.com**

MULTIDETEK 2

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: _____

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LDetek

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

NOTES

NOTES

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