

LDetek CHROMATOmag

FIRST EDITION

PETROCHEMICAL
FORMAL DEHYDE
NITRIC OXIDE
AMMONIA
SAFETY

FOOD
ETHANE
PROPANE
1-BUTENE
HYDROGEN
XENON
NITROGEN
WATER
CARBON MONOXIDE
TETRAFLUOROMETHANE
DIFLUOROETHANE
METHYL CHLORIDE

ENVIRONMENT
ISOBUTANE
KRYPTON
OXYGEN
NEON
N-BUTANE
NITROUS OXIDE
ACRYLIC ACID
ACETYLENE
NITRIC DIOXYDE
CARBON DIOXIDE
HEALTH

INDUSTRIAL GASES
AIR
ARSINE
ACETAL DEHYDE

AGRICULTURE
PROPYNE

MEDECINE
BEVERAGE
PHARMACEUTICAL
GREENHOUSE GASES
METHYL CHLORIDE



LDetek

Where innovation leads to success

TABLE OF CONTENTS

PlasmaDetek 2	3
MultiDetek 2	4
Introduction	5
Trace Acetaldehyde analysis	6
Trace Formaldehyde & Acetaldehyde analysis	6
Trace Arsine analysis	7
Trace Phosphine analysis	7
Trace Water analysis	8
Trace CO ₂ analysis	8
Trace light hydrocarbons analysis	9
Trace H ₂ S-COS analysis IN SYNGAS OR AIR	9
Trace H ₂ S-COS analysis IN SYNGAS OR AIR	10
Trace CH ₄ -CO ₂ analysis	10
Trace Water analysis	11
Trace C ₂ 's-C ₃ 's-C ₄ 's analysis	11
Trace AsH ₃ analysis	12
Trace PH ₃ analysis	12
Trace NH ₃ analysis	13
Trace NH ₃ analysis in N ₂ matrix	13
Trace Formaldehyde,Acetaldehyde analysis	14
Trace Acetaldehyde analysis	14
Trace N ₂ O analysis in Argon matrix	15
Trace C ₂ 'S-C ₃ 'S-C ₄ 'S analysis in N ₂ matrix	15
Trace AsH ₃ Analysis	16
Trace PH ₃ Analysis	16
Trace N ₂ in Crude Argon	17
Trace CH ₄ -CO ₂ -N ₂ O Analysis	17
Trace CH ₄ -CO ₂ -N ₂ O Analysis in Air	18
Trace H ₂ -O ₂ -N ₂ -CH ₄ -CO-C ₂ 's-C ₃ 's-C ₄ 's Analysis	19
Trace Ar in Oxygen matrix	20
Trace H ₂ S-COS Analysis in Nitrogen matrix	20
Trace Kr-N ₂ analysis in Oxygen matrix	21
Trace Ne-H ₂ -Ar-Kr-N ₂ analysis	22
Trace O ₂ -N ₂ analysis in Hydrogen matrix	23
PlasmaDetek guidelines	24
MultiDetek guidelines	25
LDP1000	26
Notes	27



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 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)



MICRO GC FOR MULTIPLE IMPURITIES



With its plug and play philosophy, offering more features than never LDdetek push 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 LDdetek high performances Plasma Emission Detector technology, this stand-alone Gas Chromatograph is a flexible and customized platform providing the best solution for any type of gas analysis from ppb to % using argon or helium as carrier gas.

FEATURES & DESIGN:

- Multi trace impurities in one chassis
- Multiple configurations available in one chassis
- Based on the PlasmaDetek technology
- Use argon or helium as carrier gas
- Isothermal and/or programmed ramping ovens available
- LDdetek's electronic mass flow controllers for carrier & sample gas
- Optional integrated purifier for generating high purity carrier gas in the chassis
- Easy maintenance with its slide out design
- Compact & robust industrial rackmount 6U chassis
- ppb to % application
- Large 8.4" LCD touch screen & user friendly interface
- High performance diaphragm valves
- Ethernet connectivity for remote control
- Profibus/Modbus communication protocols
- Data storage software (LDchrom)

LDetek is proud to publish its first 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.

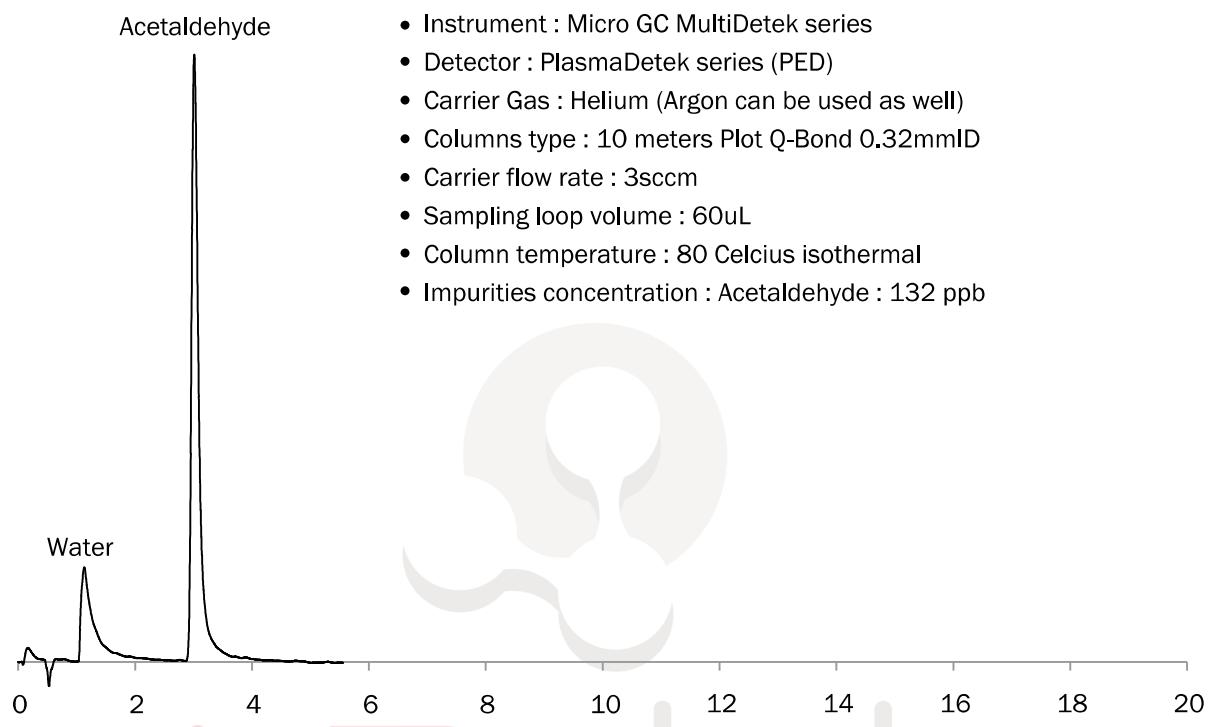
This magazine shows a variety of chromatograms that have been run in different conditions:

- The chromatograms show analysis of numerous impurities at different concentration level to see the sensitivity level of the PlasmaDetek.
- The use of both Argon and Helium 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 as carrier gas is more and more attractive.
- The components have been analyzed using different type 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 of 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.

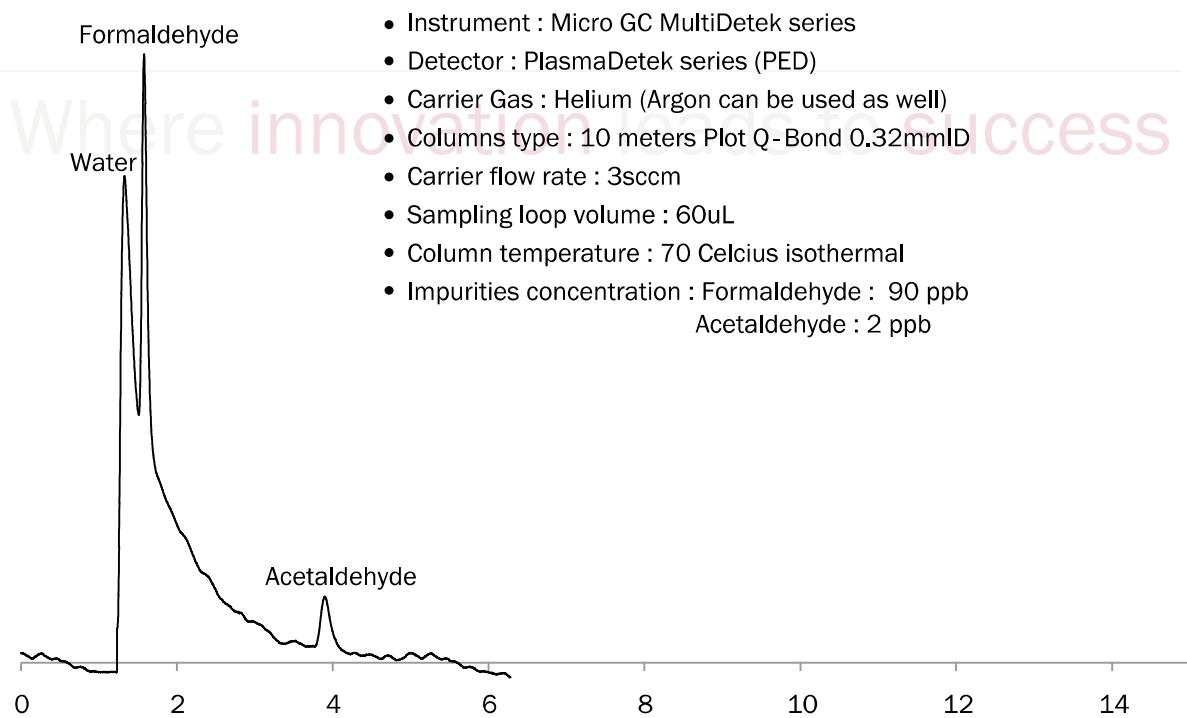
If you have an application for which you would like to have a quotation for the PlasmaDetek or the MultiDetek, at the end of the magazine, you will find the PlasmaDetek and the MultiDetek guidelines. Feel free to fill the form with the details about your application and send it back to info@ldetek.com.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

TRACE ACETALDEHYDE ANALYSIS

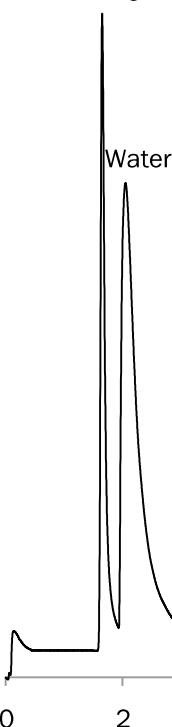


TRACE FORMALDEHYDE & ACETALDEHYDE ANALYSIS



TRACE ARSINE ANALYSIS

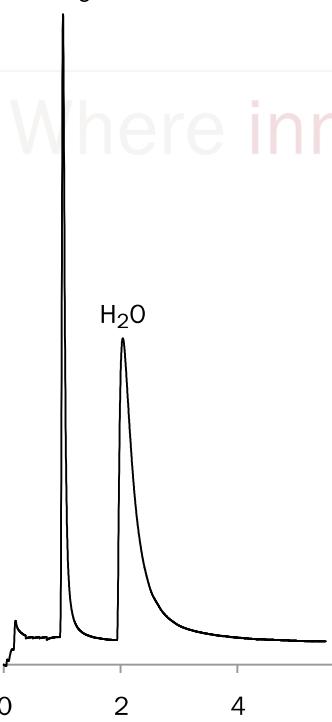
AsH₃



- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Columns type : 10 meters Plot Q -Bond 0.32mmID
- Carrier flow rate: 3sccm
- Sampling loop volume : 60uL
- Column temperature : 50 Celcius isothermal
- Impurities concentration : AsH₃ : 6.2 ppm

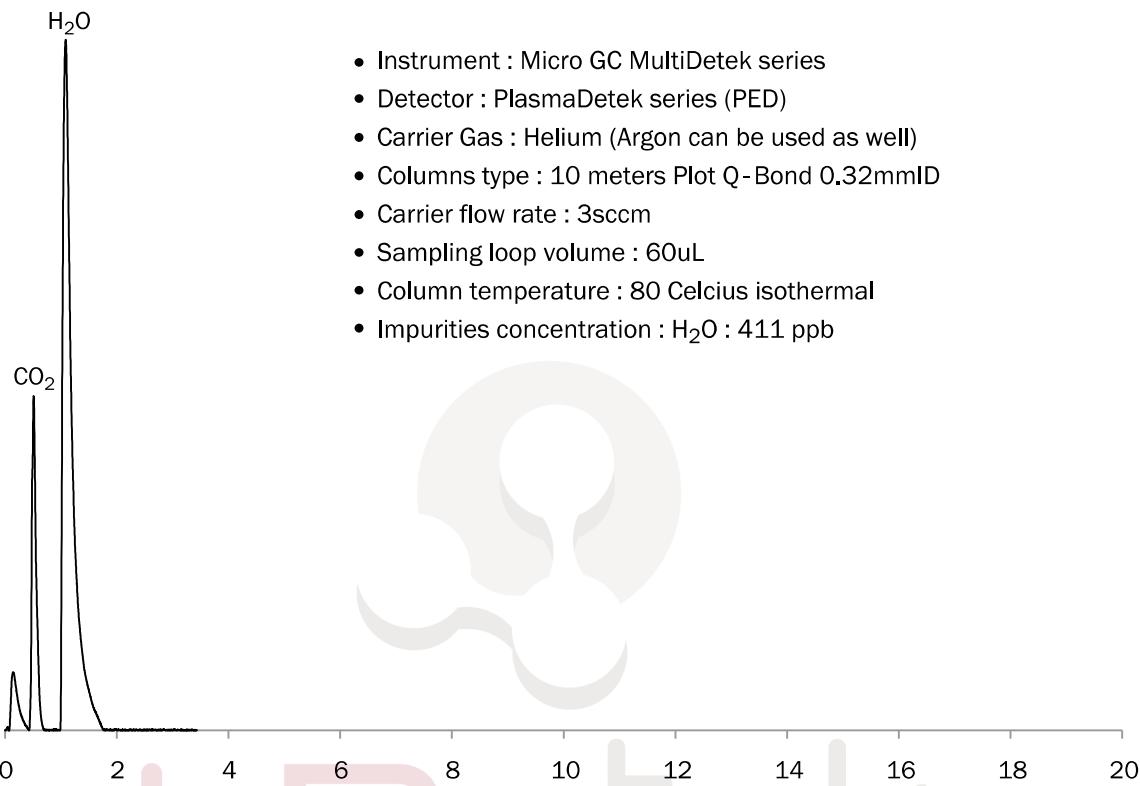
TRACE PHOSPHINE ANALYSIS

PH₃

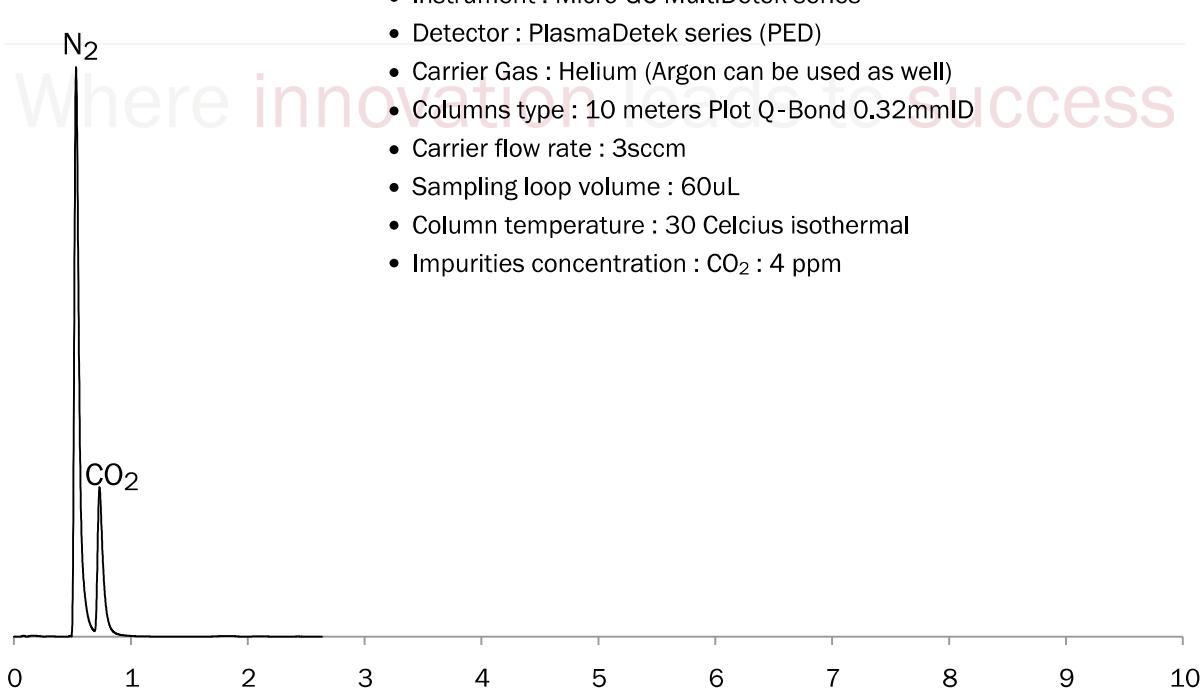


- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Columns type : 10 meters Plot Q-Bond 0.32mmID
- Carrier flow rate : 3sccm
- Sampling loop volume : 60uL
- Column temperature : 50 Celcius isothermal
- Impurities concentration : PH₃ : 7.5 ppm

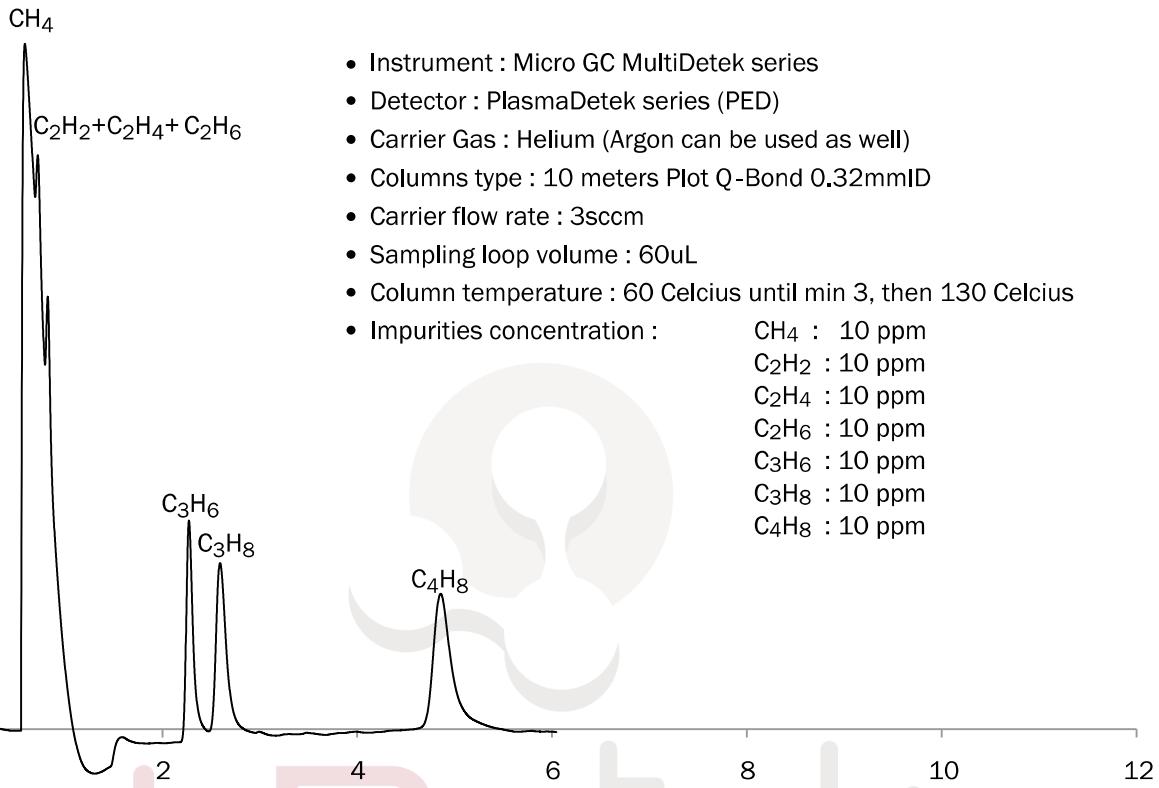
TRACE WATER ANALYSIS



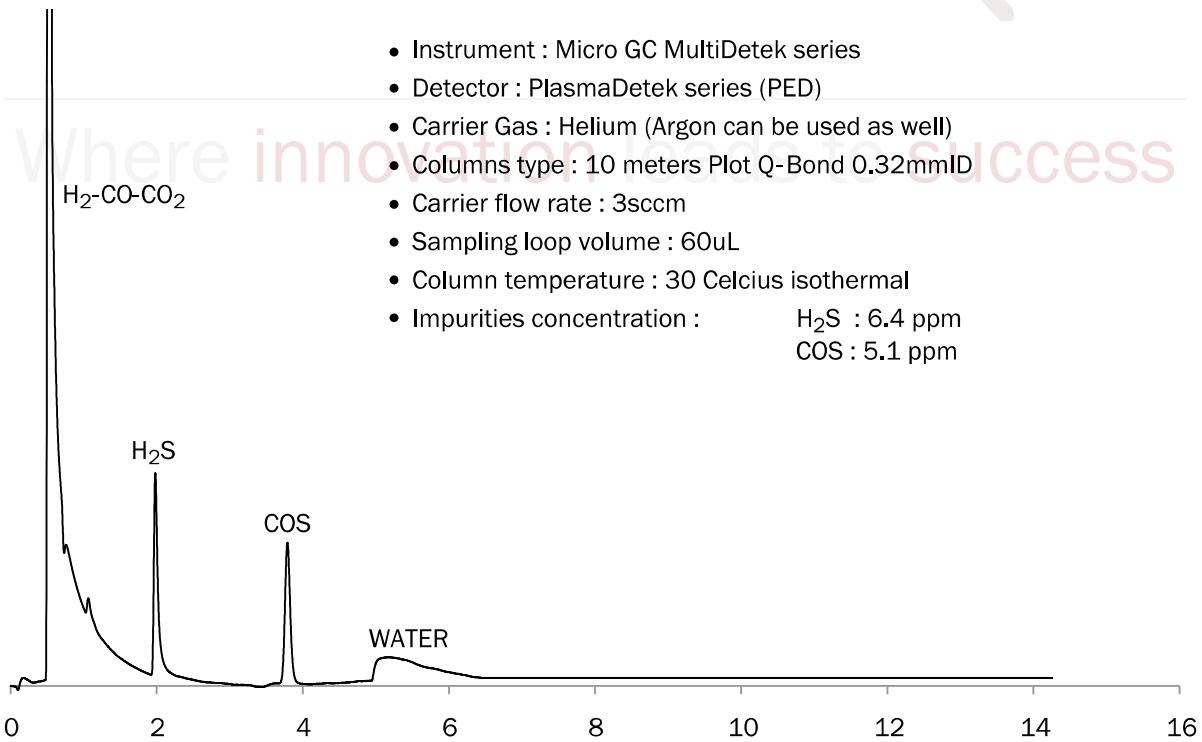
TRACE CO₂ ANALYSIS



TRACE LIGHT HYDROCARBONS ANALYSIS



TRACE H₂S-COS ANALYSIS IN SYNGAS OR AIR



TRACE H₂S-COS ANALYSIS IN SYNGAS OR AIR

H₂-CO-CO₂

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

H₂S

WATER
COS



TRACE CH₄-CO₂ analysis

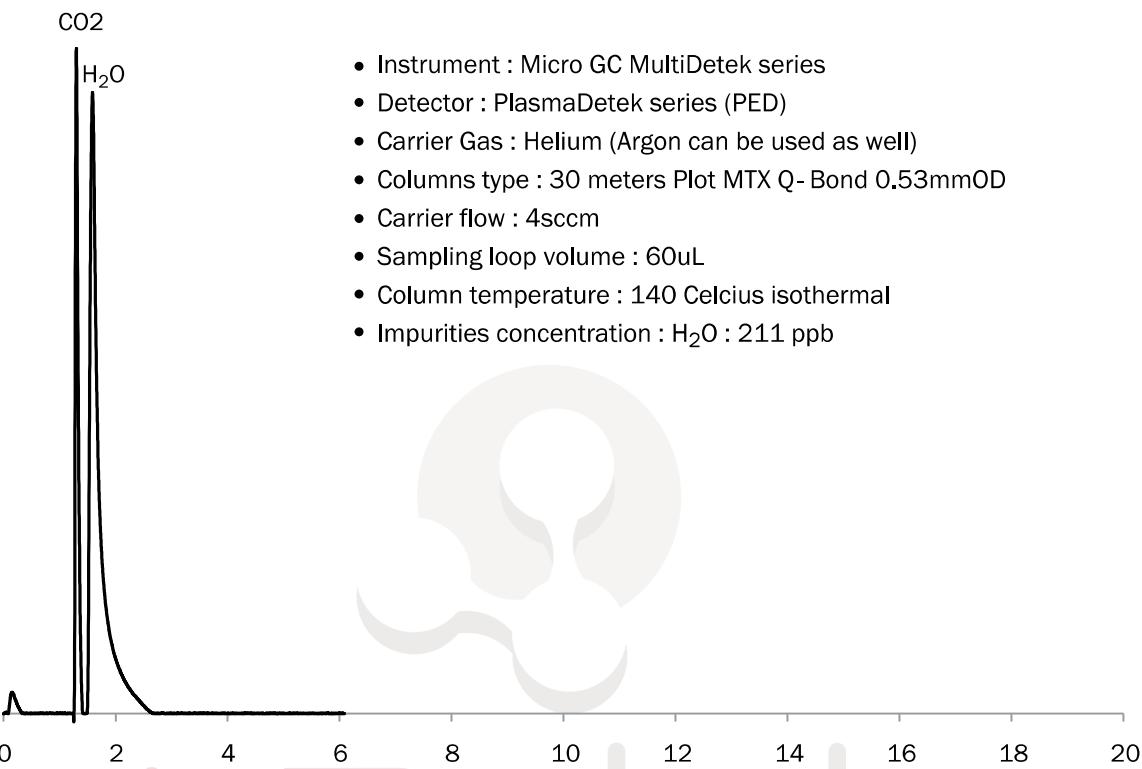
CH₄

- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Columns type : 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 30 Celcius isothermal
- Impurities concentration : CH₄ : 9.0 ppm
 CO₂ : 3.1 ppm

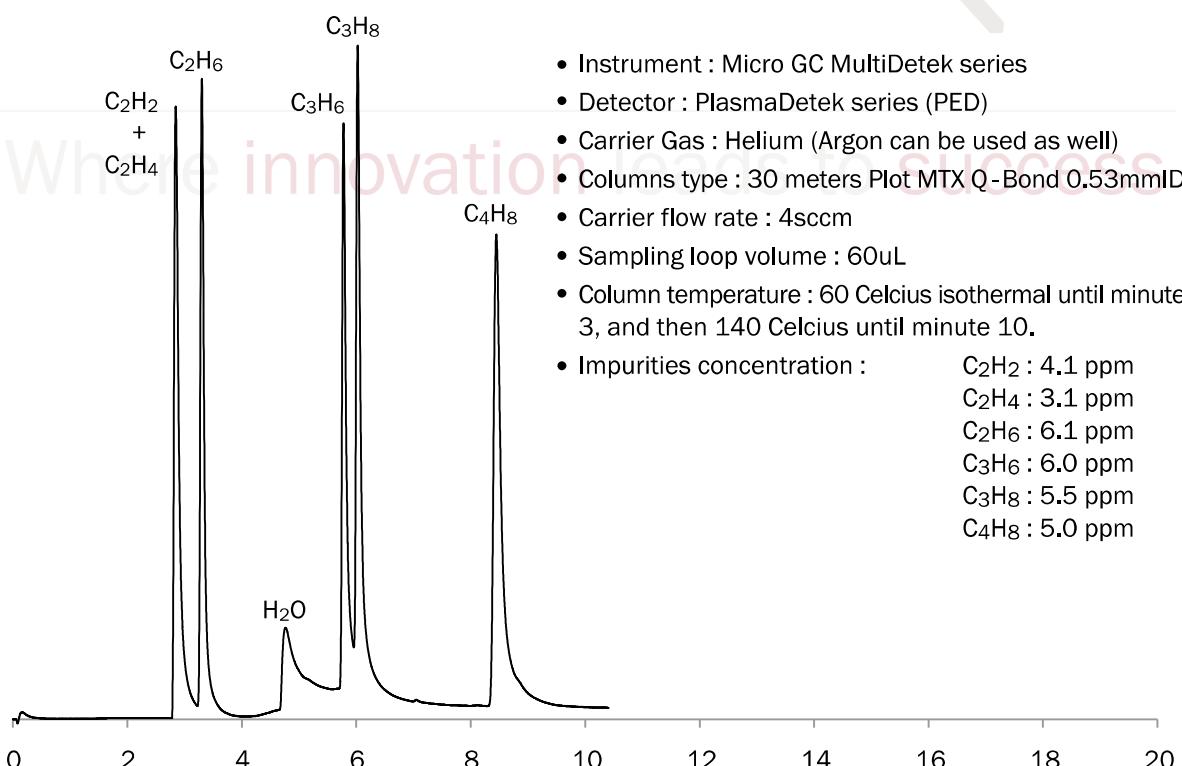
CO₂



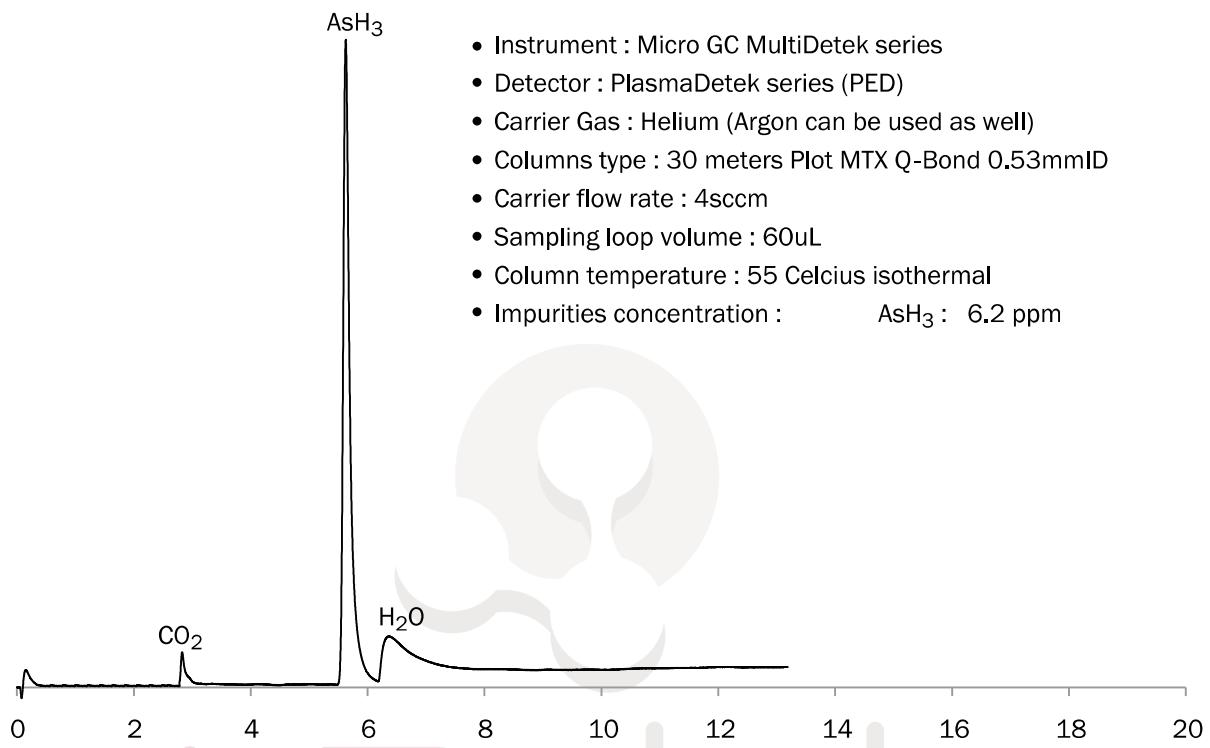
TRACE WATER ANALYSIS



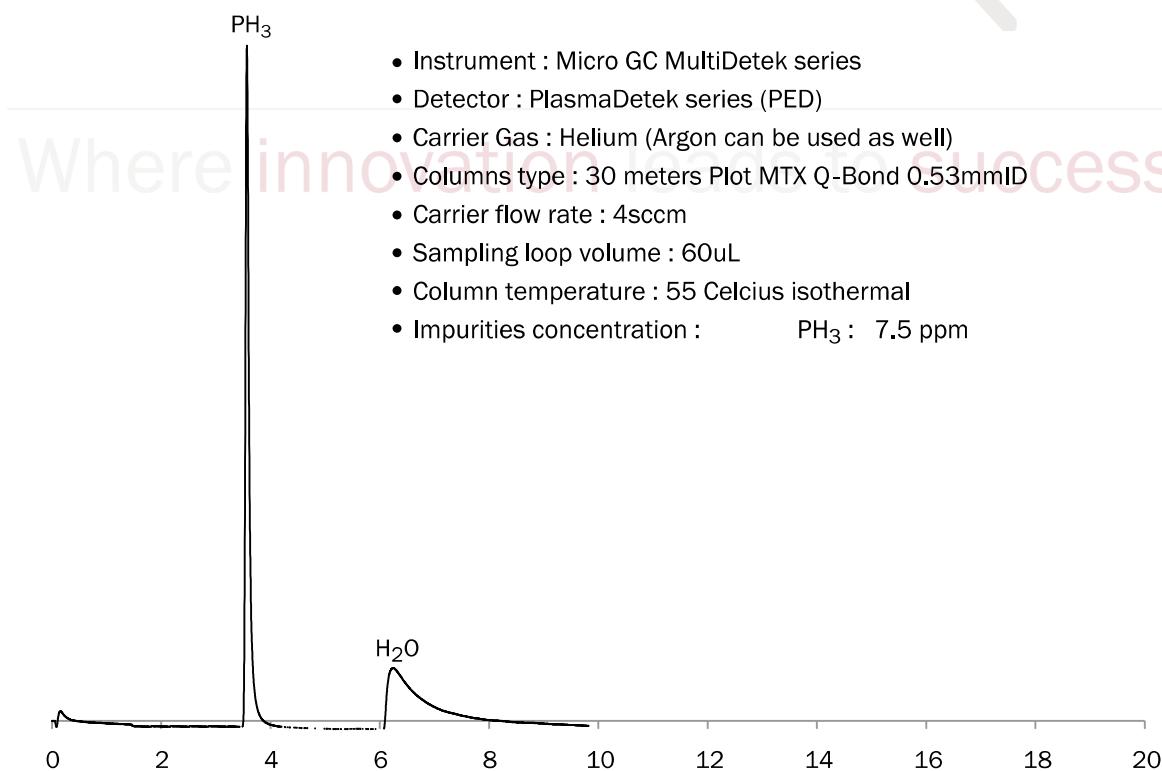
TRACE C₂'S-C₃'S-C₄'S ANALYSIS



TRACE AsH₃ ANALYSIS

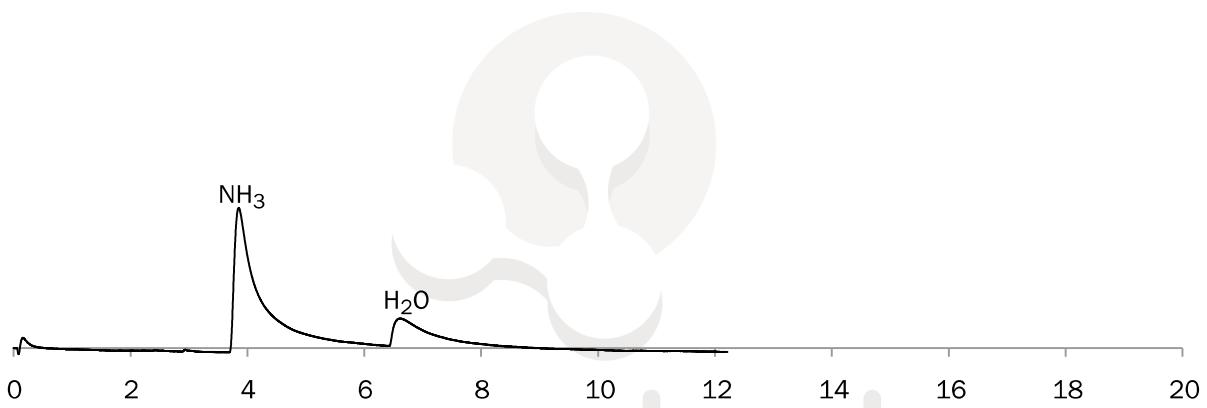


TRACE PH₃ ANALYSIS



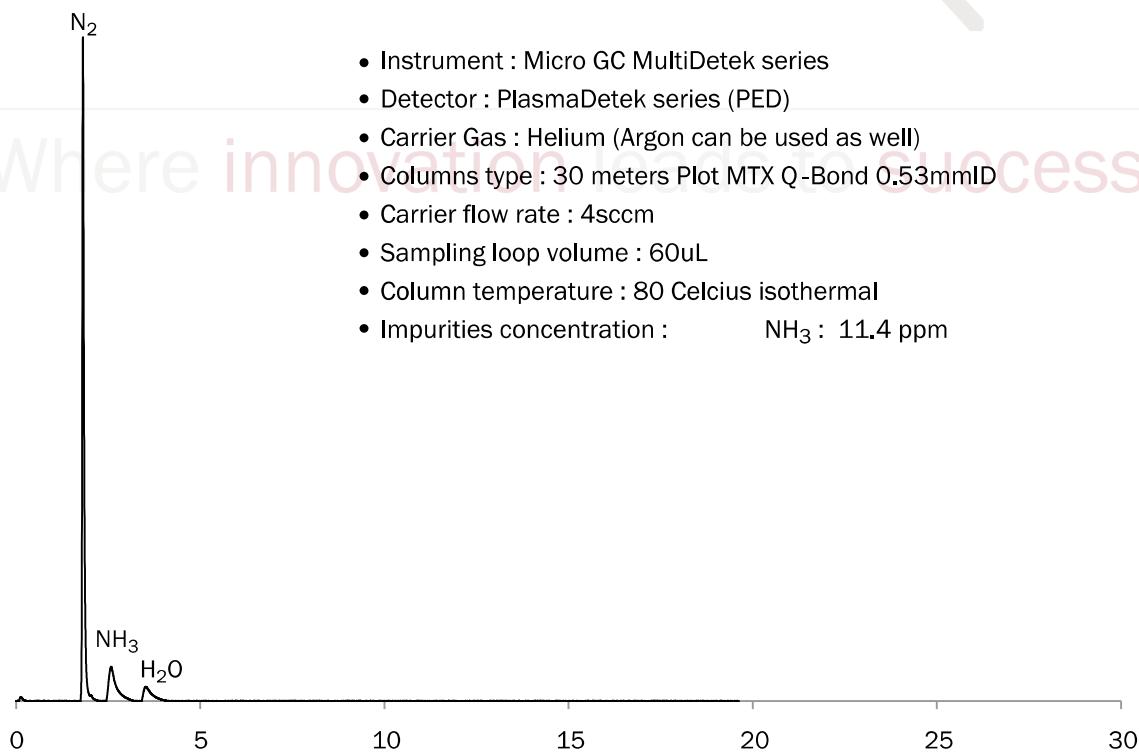
TRACE NH₃ ANALYSIS

- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Columns type : 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 55 Celcius isothermal
- Impurities concentration : NH₃ : 3.4 ppm



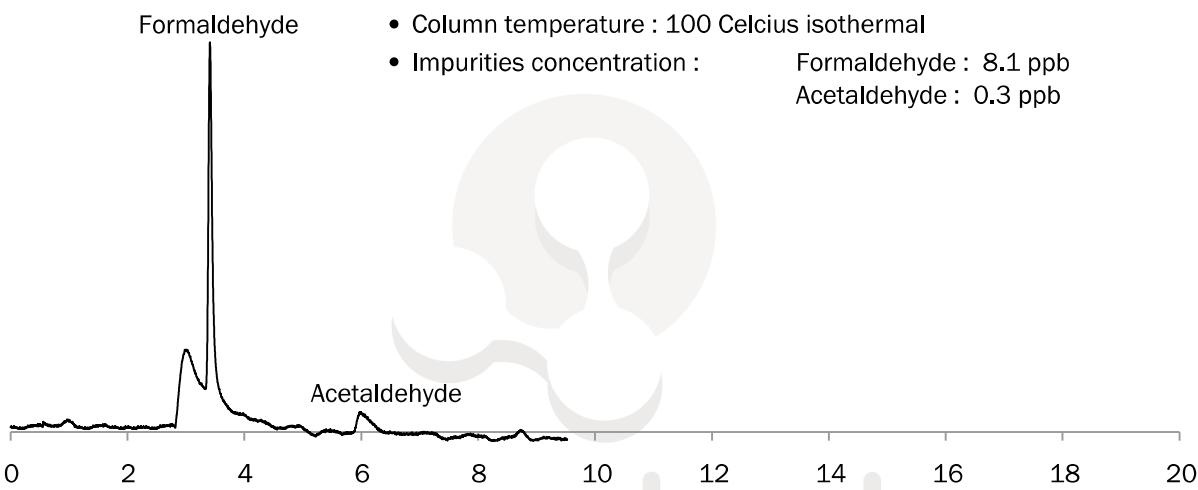
TRACE NH₃ ANALYSIS IN N₂ MATRIX

- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Columns type : 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 80 Celcius isothermal
- Impurities concentration : NH₃ : 11.4 ppm



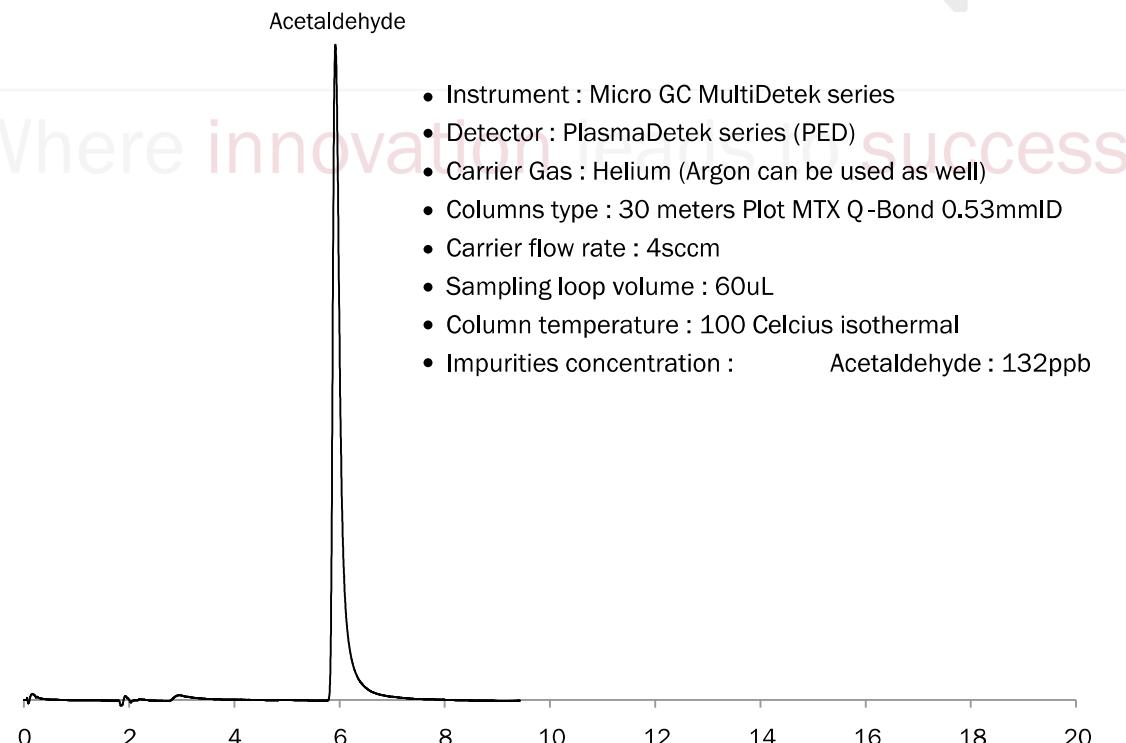
TRACE FORMALDEHYDE, ACETALDEHYDE ANALYSIS

- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Columns type : 30 meters Plot MTX Q-Bond 0.53mmID
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 100 Celcius isothermal
- Impurities concentration : Formaldehyde : 8.1 ppb
 Acetaldehyde : 0.3 ppb



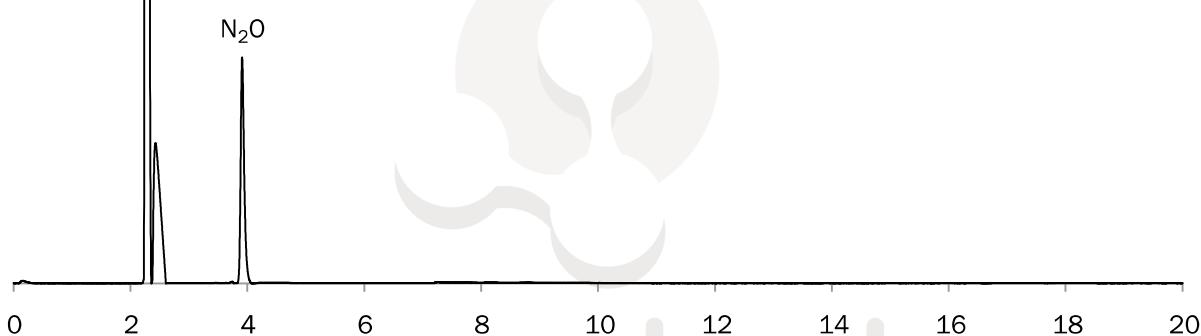
TRACE ACETALDEHYDE ANALYSIS

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



TRACE N₂O ANALYSIS IN ARGON MATRIX

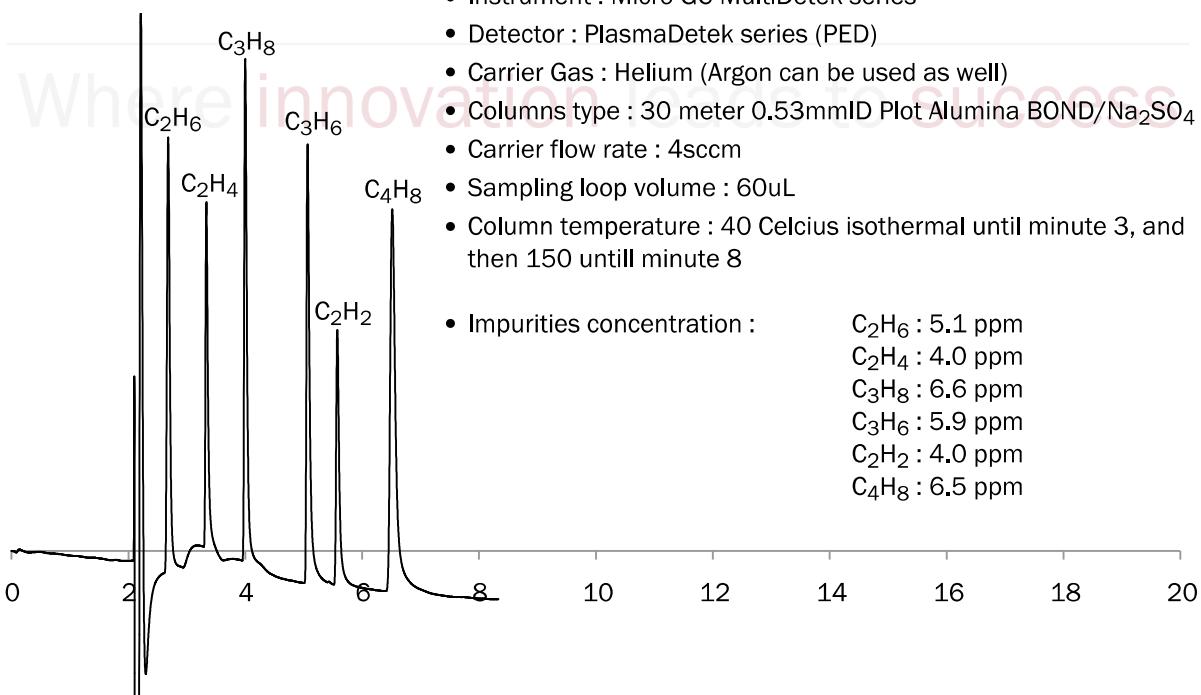
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Columns type : 30 meter 0.53mmID Plot Alumina BOND/Na₂SO₄
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 40 Celcius isothermal
- Impurities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



TRACE C₂'S-C₃'S-C₄'S ANALYSIS IN N₂ MATRIX

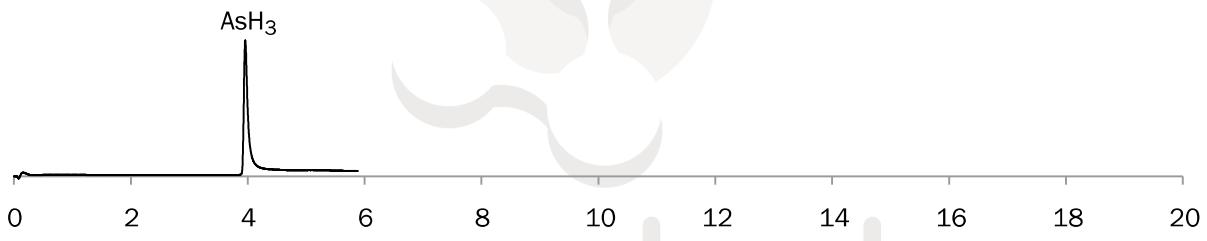
- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Columns type : 30 meter 0.53mmID Plot Alumina BOND/Na₂SO₄
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 40 Celcius isothermal until minute 3, and then 150 until minute 8

- Impurities concentration :
 - C₂H₆ : 5.1 ppm
 - C₂H₄ : 4.0 ppm
 - C₃H₈ : 6.6 ppm
 - C₃H₆ : 5.9 ppm
 - C₂H₂ : 4.0 ppm
 - C₄H₈ : 6.5 ppm



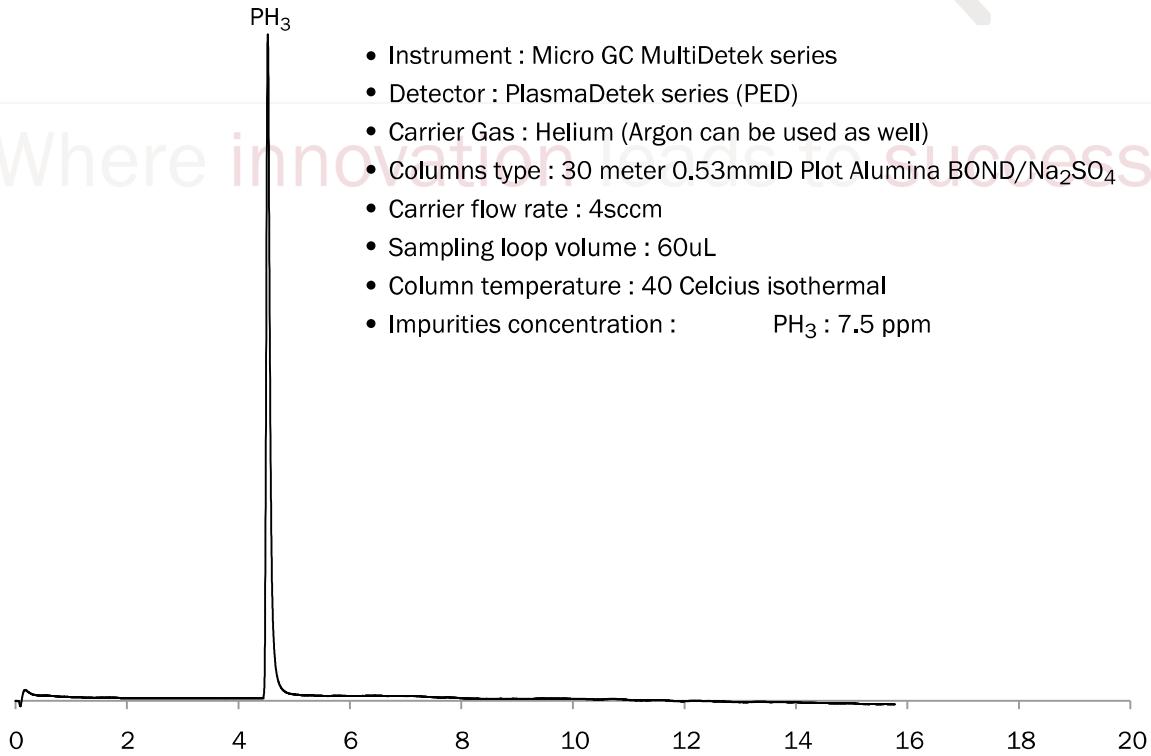
TRACE AsH₃ ANALYSIS

- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Columns type : 30 meter 0.53mmID Plot Alumina BOND/Na₂SO₄
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 40 Celcius isothermal
- Impurities concentration : AsH₃ : 6.2 ppm



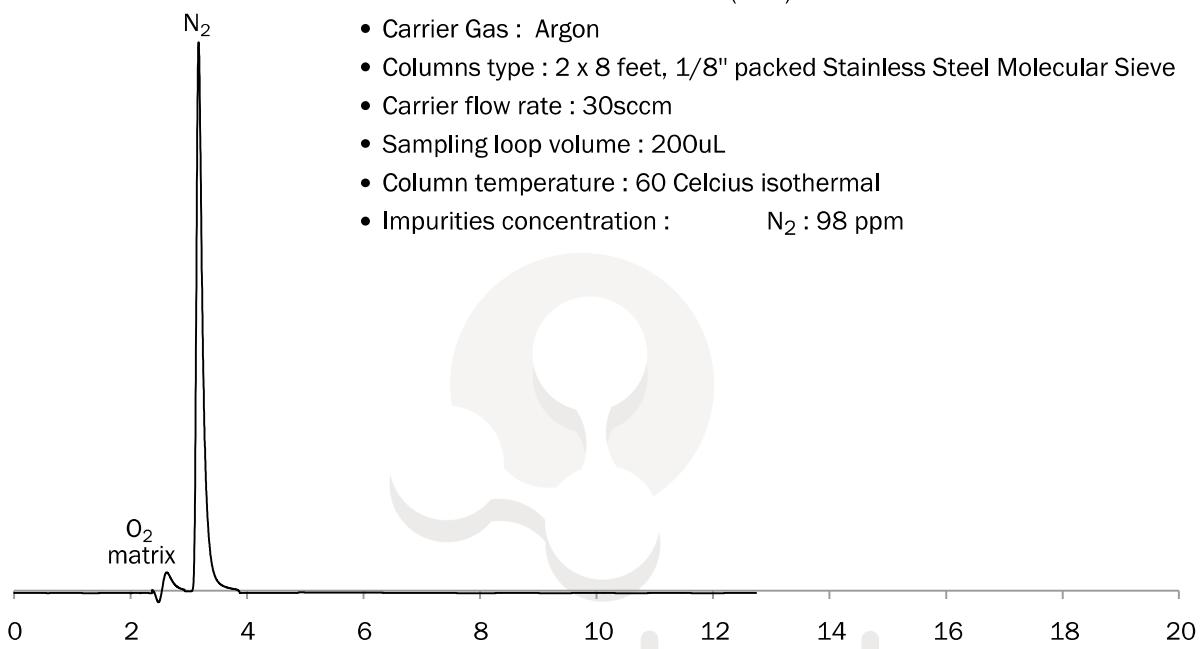
TRACE PH₃ ANALYSIS

- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Columns type : 30 meter 0.53mmID Plot Alumina BOND/Na₂SO₄
- Carrier flow rate : 4sccm
- Sampling loop volume : 60uL
- Column temperature : 40 Celcius isothermal
- Impurities concentration : PH₃ : 7.5 ppm



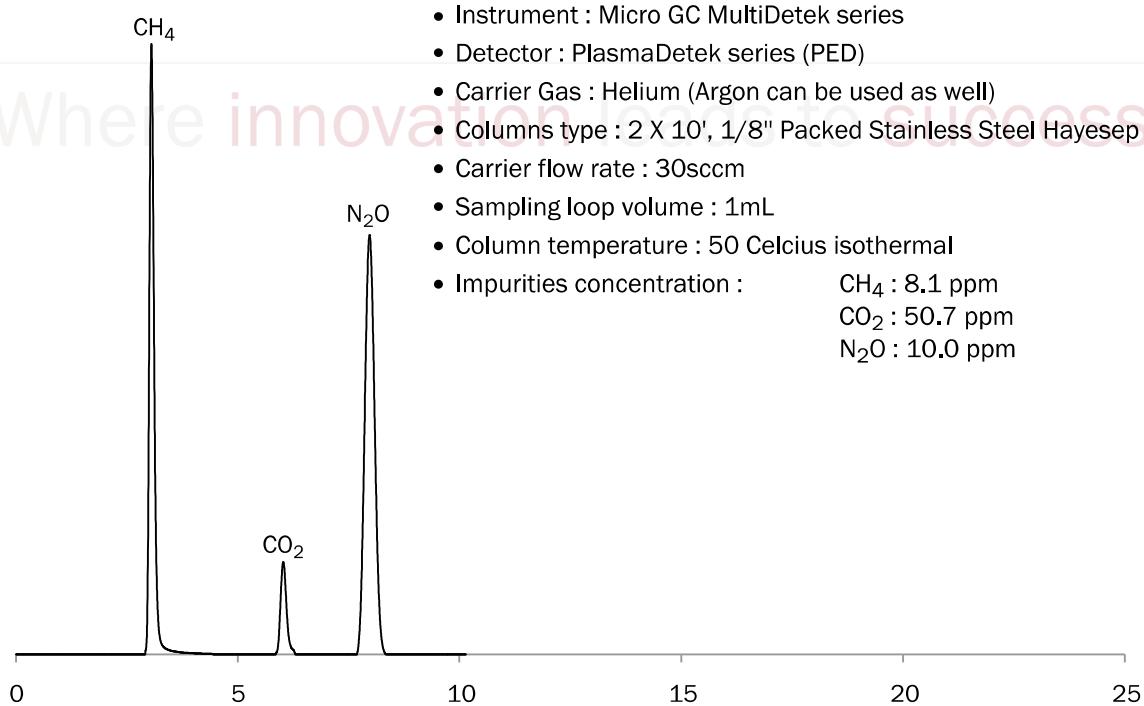
TRACE N₂ IN CRUDE ARGON

- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Argon
- Columns type : 2 x 8 feet, 1/8" packed Stainless Steel Molecular Sieve
- Carrier flow rate : 30sccm
- Sampling loop volume : 200uL
- Column temperature : 60 Celcius isothermal
- Impurities concentration : N₂ : 98 ppm

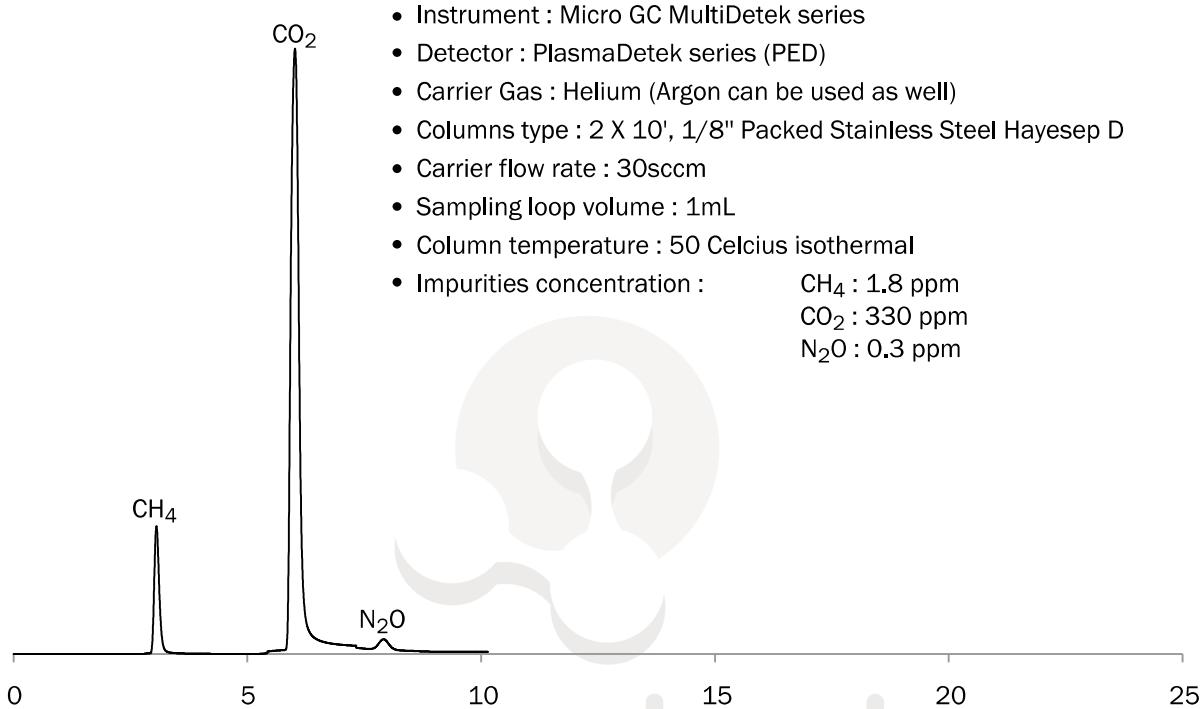


TRACE CH₄-CO₂-N₂O ANALYSIS

- Instrument : Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium (Argon can be used as well)
- Columns type : 2 X 10', 1/8" Packed Stainless Steel Hayesep D
- Carrier flow rate : 30sccm
- Sampling loop volume : 1mL
- Column temperature : 50 Celcius isothermal
- Impurities concentration : CH₄ : 8.1 ppm
CO₂ : 50.7 ppm
N₂O : 10.0 ppm

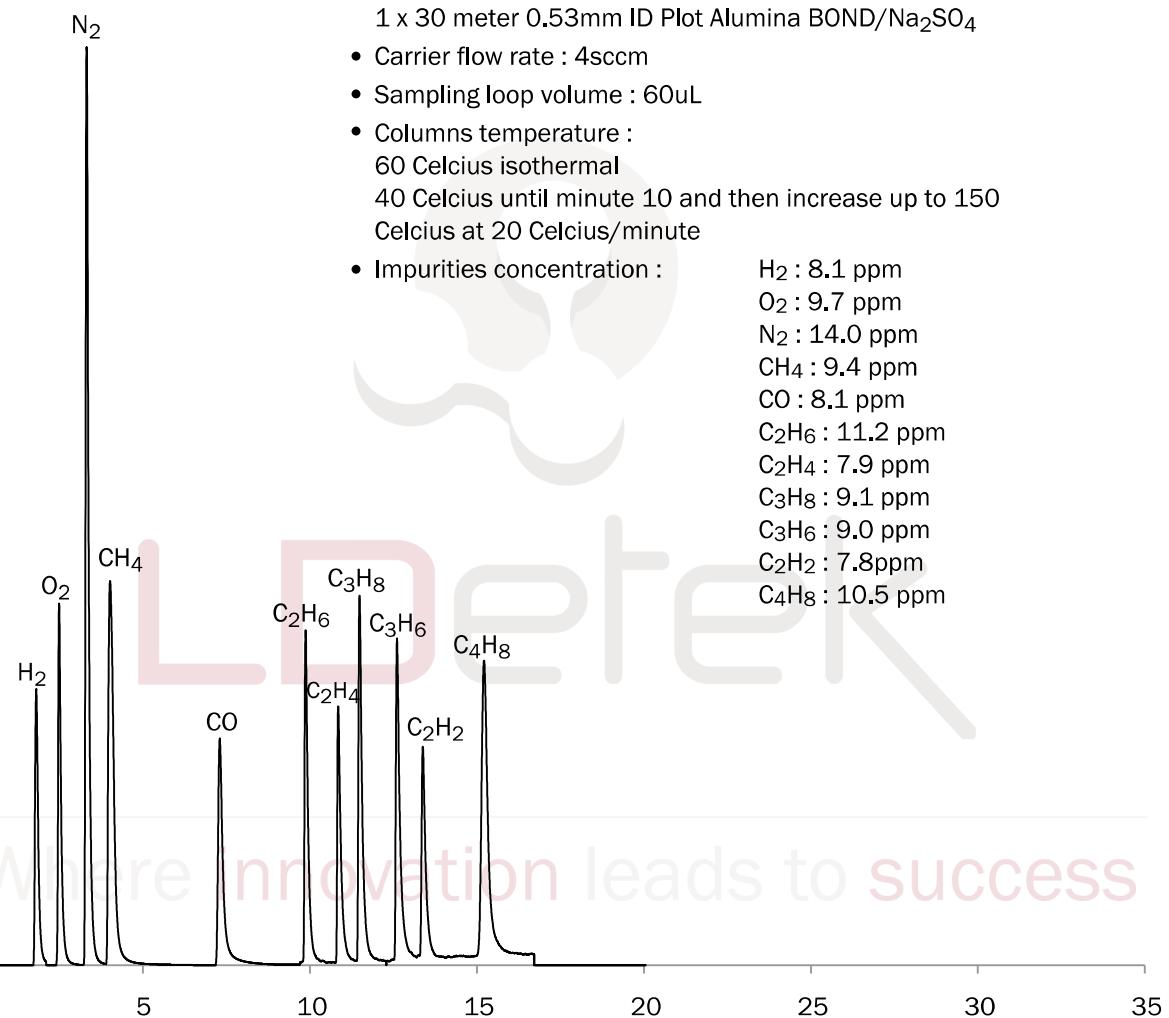


TRACE CH₄-CO₂-N₂O ANALYSIS IN AIR



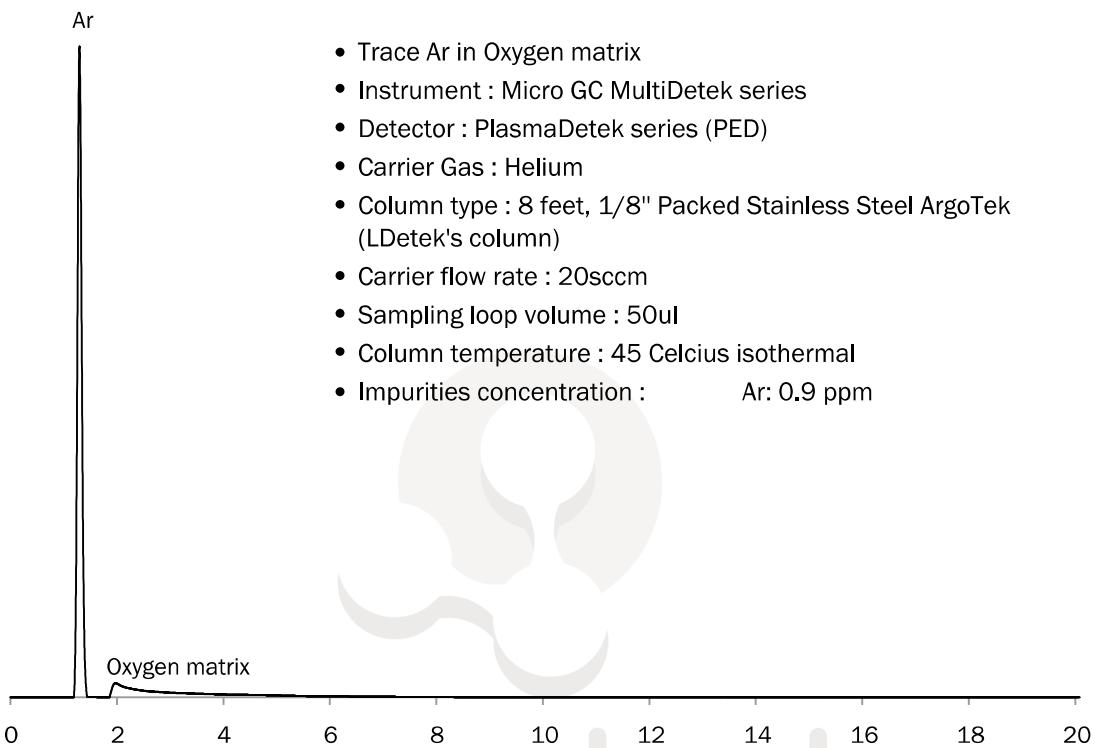
Where innovation leads to success

TRACE H₂-O₂-N₂-CH₄-CO-C₂'S-C₃'S-C₄'S ANALYSIS

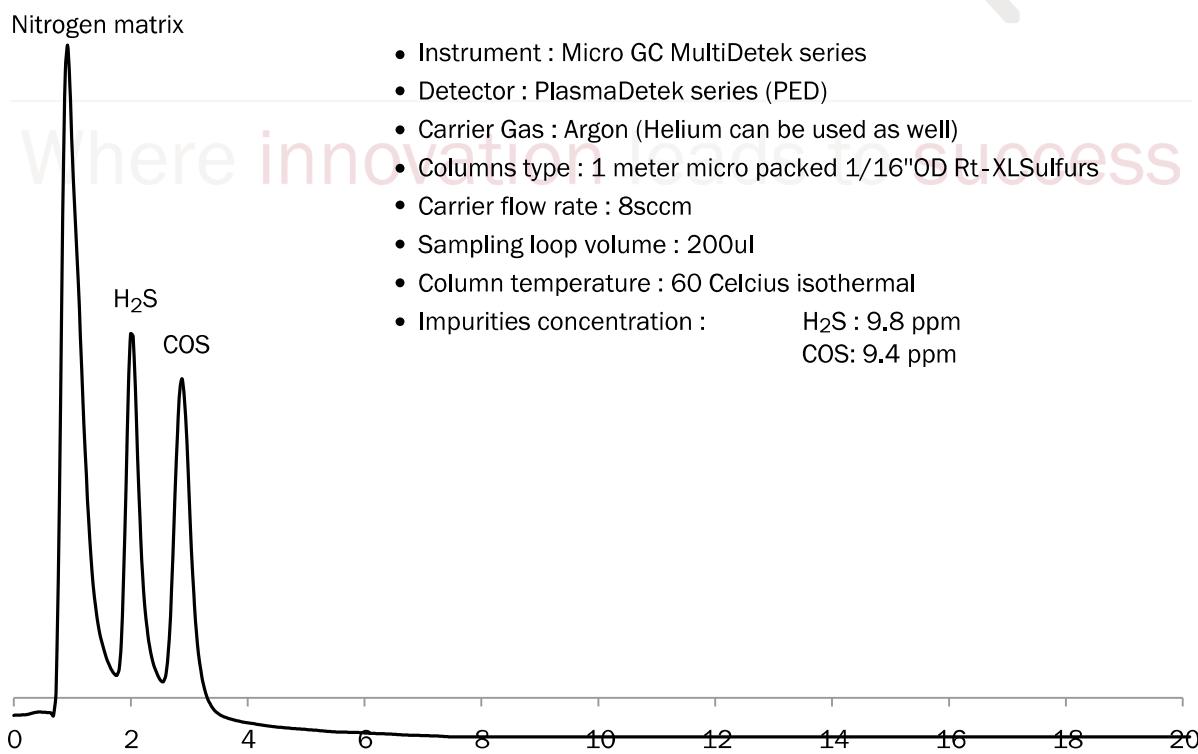


Where innovation leads to success

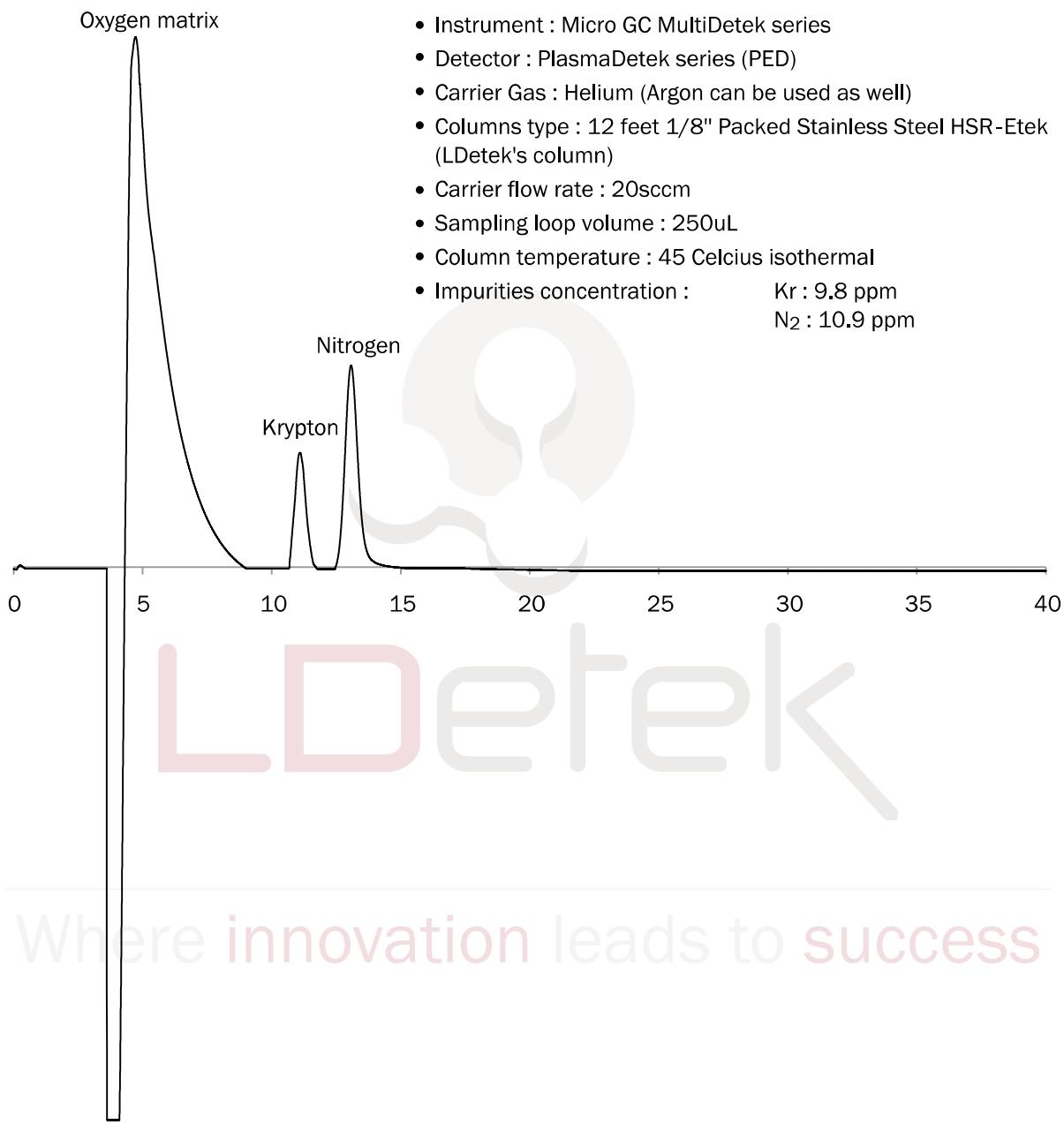
TRACE AR IN OXYGEN MATRIX



TRACE H₂S-COS ANALYSIS IN NITROGEN MATRIX



TRACE KR-N₂ ANALYSIS IN OXYGEN MATRIX



- Where it



Website NEW : www.chromalytic.com.au E-mail : info@chromtech.net.au Tel: 03 9762 2034 . . . in AUSTRALIA

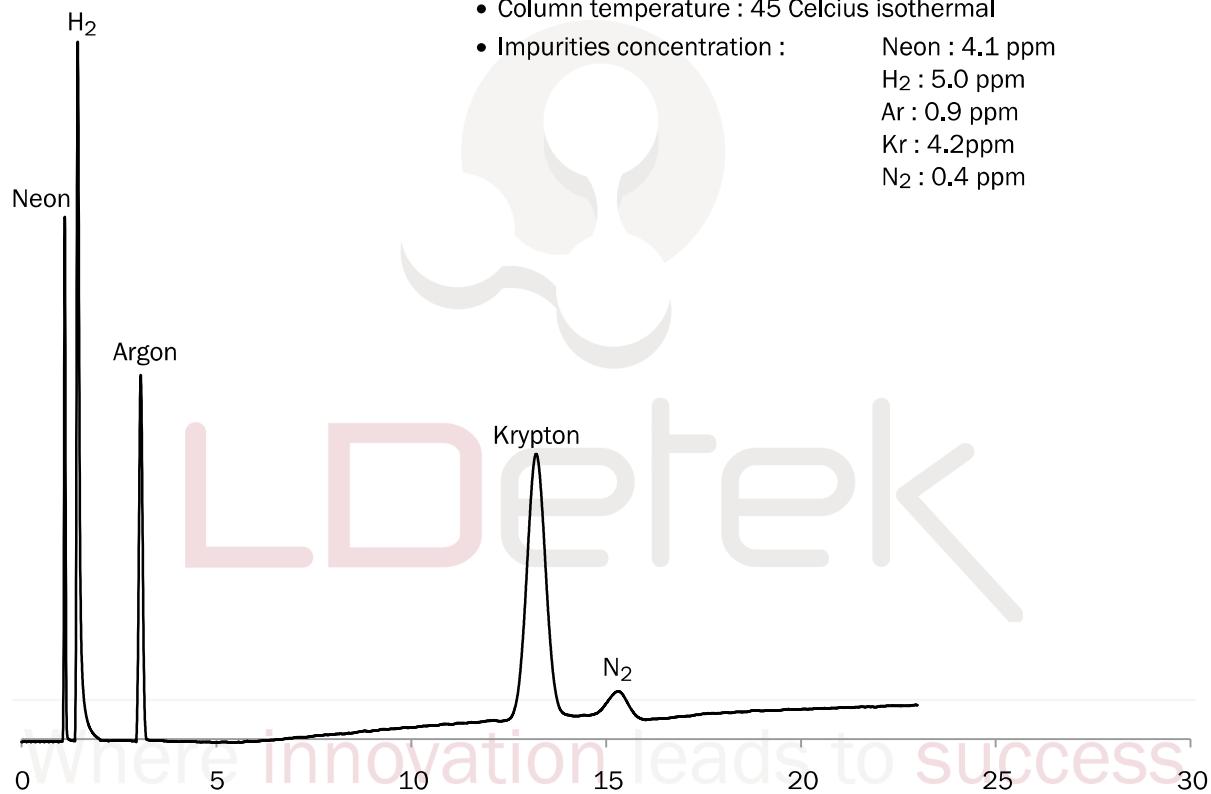
Australian Distributors

Importers & Manufacturers
www.chromtech.net.au

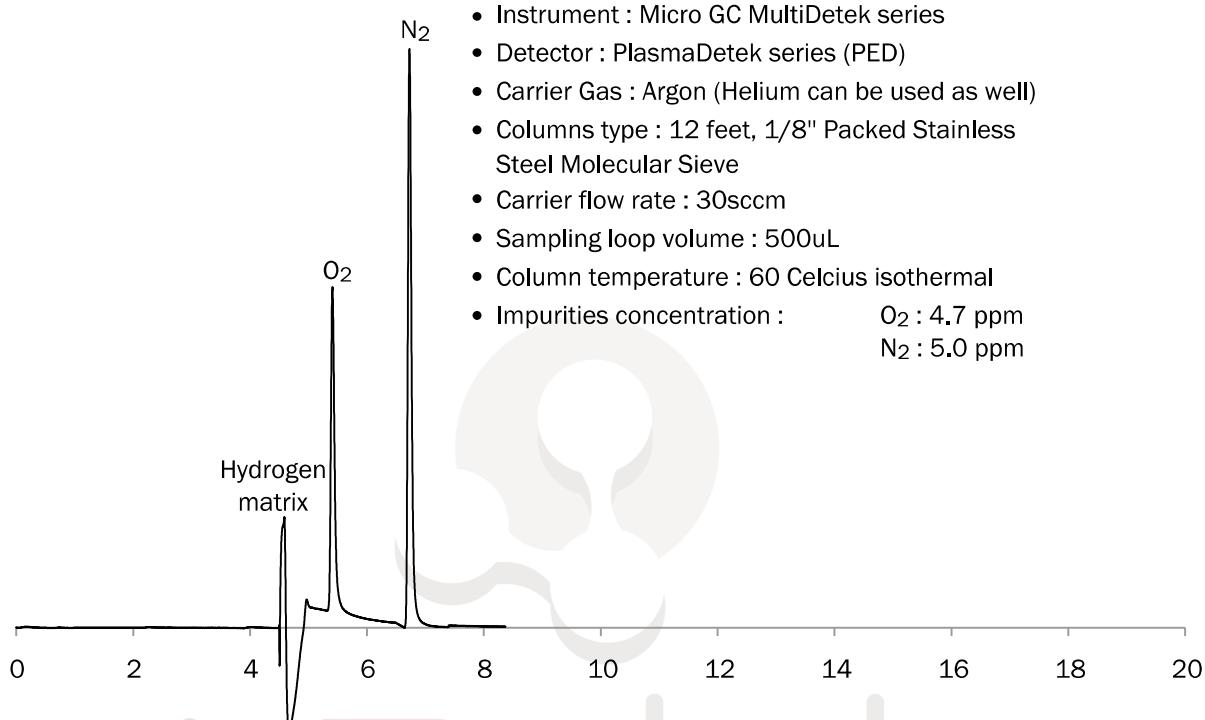
TRACE NE-H₂-AR-KR-N₂ ANALYSIS

- Micro GC MultiDetek series
- Detector : PlasmaDetek series (PED)
- Carrier Gas : Helium
- Columns type : 12 feet, 1/8" Packed Stainless Steel HSR-Etek (Ldetek's column)
- Carrier flow rate : 20sccm
- Sampling loop volume : 250uL
- Column temperature : 45 Celcius isothermal
- Impurities concentration :

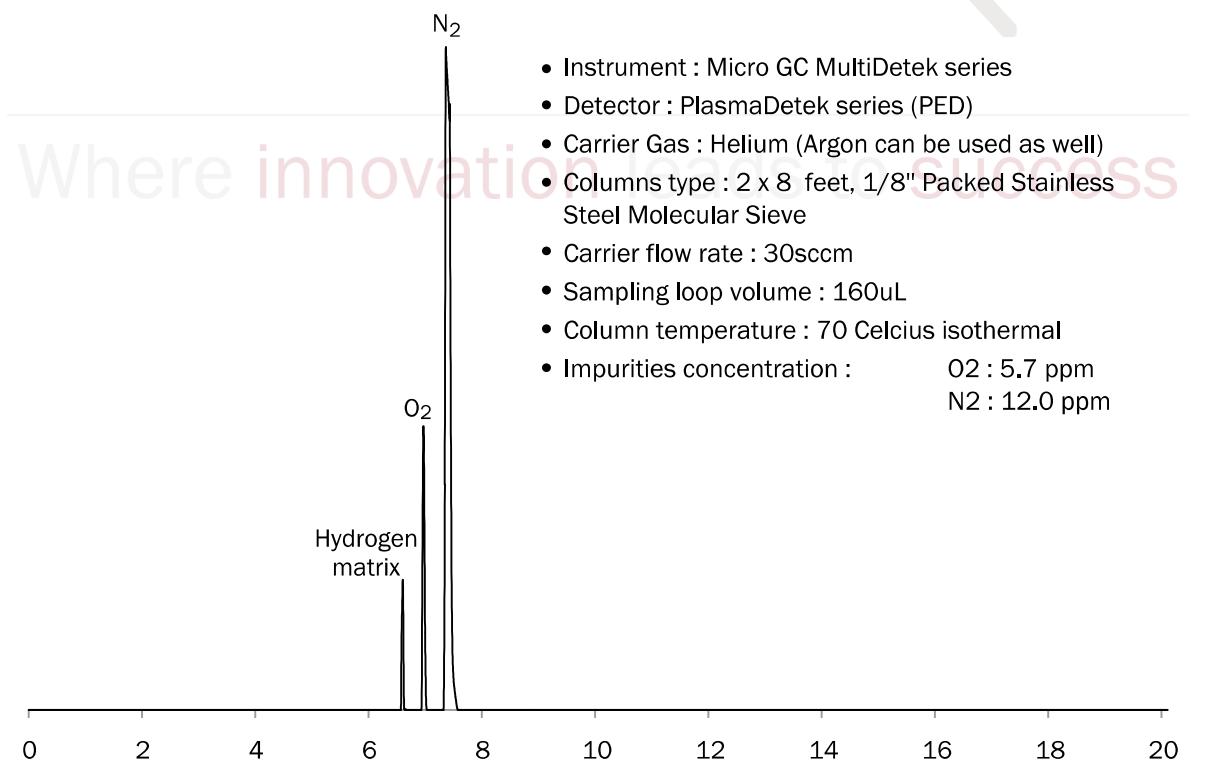
Neon : 4.1 ppm
H₂ : 5.0 ppm
Ar : 0.9 ppm
Kr : 4.2ppm
N₂ : 0.4 ppm



TRACE O₂-N₂ ANALYSIS IN HYDROGEN MATRIX



TRACE O₂-N₂ ANALYSIS IN HYDROGEN MATRIX





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:

Where innovation leads to success



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: _____



Where innovation leads to success



Website NEW : www.chromalytic.com.au E-mail : info@chromtech.net.au Tel: 03 9762 2034 . . . in AUSTRALIA

Australian Distributors
Importers & Manufacturers
www.chromtech.net.au

LDP1000



Gas purifier compatible with any trace gas analysis system

Ideal for gas calibration, the LDP1000 is a sub ppb purifier that calibrates gas for online analyzers as well as carries gas for chromatograph.

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

WHY CHOOSE LDP1000 ?

- **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



NOTES



Where innovation leads to success

©Copyright 2014 LDetek inc.