TRACE IMPURITIES ANALYSIS

TRACE IMPURITIES ANALYSIS

" *Time is Money.* **"**

Benjamin Franklin

Time is always a key factor in today's laboratories productivity.

Master your Time with the DANI Gas Analyzers.

The ability to provide the proper configuration to meet the most challenging analytical demands comes from a long and proven experience and a deep industry knowledge. As requirements are constantly changing, even a highly reliable instrumentation could not be enough to succeed in getting trustworthy results: complete and guaranteed solutions are essential to comply with the latest industry standards and specifications.

After a long working relationship with its customers to know and to best match their real needs, DANI Instruments has developed key analytical solutions that cover a broad array of applications, requirements and protocols in the environmental industry.

Master DANI Air Analyzers are PRE-CONFIGURED, PRE-ASSEMBLED AND FACTORY-TESTED SYSTEMS specifically designed for peculiar analyses. The analyzers include the HARDWARE, the SOFTWARE, COLUMNS AND CONSUMABLES, the OPTIMIZED ANALYSIS METHOD, the ANALYTICAL CONDITIONS, and the DOCUMENTATION to run up your analysis from day one.

PRE-CONFIGURED, PRE-ASSEMBLED AND FACTORY-TESTED SYSTEMS
The installation process is faster than ever before and all the startup procedure is oversimplified ensuring immediate analytical performance and results.

HARDWARE AND SOFTWARE
DAA Analyzers are pre-engineered systems based on the versatility, flexibility and robustness of the proven Master GC hardware. All the Master GC parameters are set prior the shipment.

COLUMNS AND CONSUMABLES
No more doubts about the proper column, parts and supplies. DAA Analyzers are delivered with all you may need for your analysis.*

OPTIMIZED ANALYSIS METHOD
Analytical methods are pre-loaded to be immediately used for the determination of pollutants in air. Whenever possible, reduction of analysis time and amounts of toxic solvents are considered. Method development time and costs are thus dramatically reduced.

ANALYTICAL CONDITIONS
DAA Analyzers are designed to perfectly accomplish the analytical conditions of interest.

DOCUMENTATION
A getting started manual, calibration and method files, and all the information for a quick startup are included .

* Chemicals are not supplied

DANI Master GC

- **Intuitive ad easy-to-use touchscreen interface**.
- **Complete range of injectors**:
    - Split/Splitless Injector
    - Programmable Temperature Vaporizer (PTV)
    - Packed Injector
- **Wide selection of detectors**:
    - Flame Ionization Detector (FID)
    - Electron Capture Detector (ECD)
    - Nitrogen-Phosphorus Detector (NPD)
    - Flame Photometric Detector (FPD)
    - Thermal Conductivity Detector (TCD)
    - Pulse Discharge Detector (PDD)
    - Master TOF-MS Time of Flight Mass Spectrometer
- **Extensive Choice of Dedicated Devices**:
    - Auxiliary ovens
    - Gas sampling and switching valves
    - Liquid sampling valves
    - GC oven cryogenic cooling device
    - Methanizer

DANI Master AUX

Auxiliary Ovens for Isothermal Temperature

- Up to 7 valves (5 gas + 2 liquids)
- Up to 250° C
- Up to 2 auxiliary gas valves
- Up to 6 needle valves
- Extremely compact design
- Two models available with different capacities to house valves and columns for dedicated analyses

DANI Master SHS

Static Headspace Sampler

- A robust and flexible system to meet complex and versatile needs
- Reliable results and exceptional reproducibility
- Intuitive, powerful, and straightforward user interface
- Highest sample capacity with a 120-position vial tray
- Unlimited priority sample position
- Unmatched oven capacity: 18 vials simultaneously

DANI Master AS

Liquid Autosampler

- Superior flexibility, repeatability, and performance
- Easy-to-use
- 160 samples capacity
- No sample degradation or solvent evaporation
- up to 7 syringe capacity types
- unmatche injection capabilities
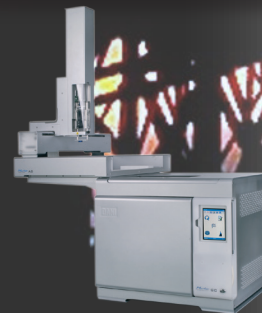
TRACE IMPURITIES ANALYSIS

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DGA-008
Trace Impurities Analyzer for Hydrocarbons and CO CO2

The DGA-008 Analyzer enables the analysis of hydrocarbons which is performed using a Split Splitless (SL/IN) injector, capillary columns and an FID detector.

This MASTER GC Analyzer also fulfils the need of an accurate and effective determination of CO and CO_2 at ppm level. For this purpose the MASTER GC Analyzer includes a second channel that is equipped with a packed (PK) injector, packed columns and an FID detector.

On this channel a Methanizer is present to allow the determination of CO and CO_2 using the FID detector.

Moreover, the gas chromatograph is configured with three valves: two 6-port valves and an 8-port valve located in the GC auxiliary oven.

DANI DGA-008 is the ready-to-go solution to attain the maximum performance in the shortest time for your analysis of Hydrocarbons and CO CO_2

Master DGA-008

SAMPLE TYPE:
Gas

TYPICAL DETECTED COMPOUNDS:
CO, CO_2 at ppm levels

OFFICIAL METHODS MET:
UOP 603

KEY FEATURES & BENEFITS:

Accurate and efective determination of CO and CO_2 at ppm levels;

Reliable and precise detection and determiantion of hydrocarbons un to C_{6+};

Channel A is dedicated to the analysis of hydrocarbons and includes two 6-port valves and one FID detector. A valve and an auxiliary gas system allow to backflush the heavier hydrocarbons;

A 50 m Retention Gap (0.53 mm) and an adjustable restrictor on Channel A balance the flow and permit to backflush;

CO and CO_2 analysis is performed through Channel B equipped with a 8-port valve, the Methanizer and a FID detector;

A valve and an auxiliary gas system on Channel B allow to backflush the hydrocarbons (except methane);

All the analytical parameters can be controlled by the DDS Clarity™ Chromatography Station Software;
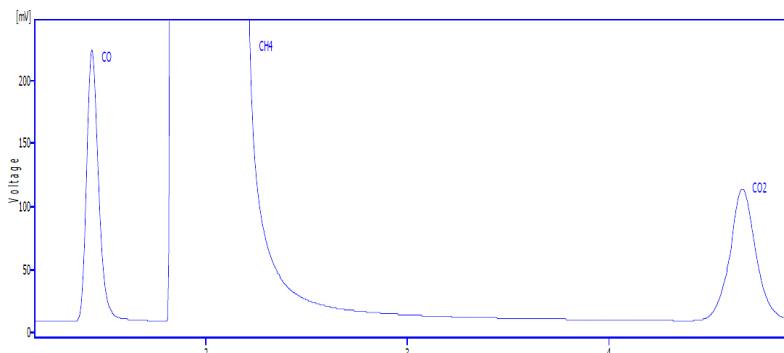
CO and CO$_2$ analysis.
FID A chromatogram of the CO and CO2 standard mixture. It is possible to see the peaks of CO, CH4, CO$_2$.

μTCD analysis of C6 hydrocarbons mixture

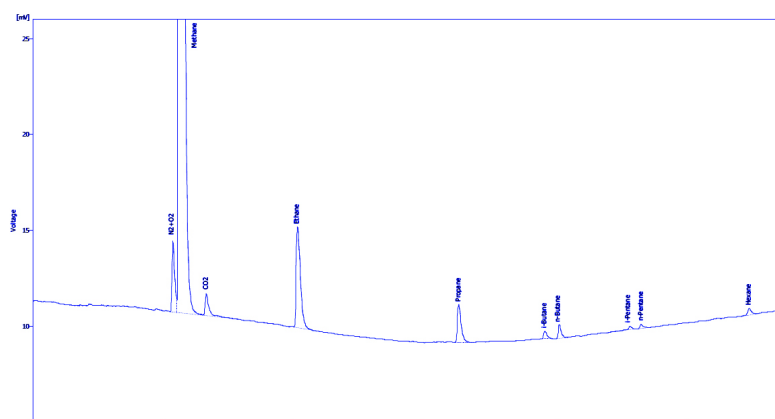| EXPERIMENTAL PARAMETERS FOR HYDROCARBON ANALYSIS		
Master GC Analyzer		
Columns	Channel A	WCOT CP SII (30m, 0.32 mm, 3μm) Plot Al203/Na2S04 (50m, 0.32mm, 5μm)
GC Oven		
Temperature	32°C (for 10 min), 50°C/min to 150° C (for 20 min)	
Injector A: SL/IN		
Temperature	200°C	
Carrier Gas	Helium	
Split Ratio	1:10	
Flow	6 ml/min	
Injector B : PK		
Temperature	40°C	
Carrier Gas	Helium	
Maximum Pressure	n/a	
Flow	1 ml/min	
Detector A : FID A Channel 1		
Temperature	280°C	
Aux A Flow (N$_2$)	26 ml/min	
H$_2$ Flow	45 ml/min	
Air Flow	272 ml/min	
Auxiliary Pressure		
AUX 1 Pressure (He)	3 bar	
AUX 2 Pressure	2.2 bar	
Auxiliary Temperature		
Aux temp - Aux oven temp	150°C	

EXPERIMENTAL PARAMETERS FOR CO AND CO$_2$ ANALYSIS		
Master GC Analyzer		
Columns	Channel B	Hayesep R (2.5m, 1/8", 80/100 mesh) Hayesep R (1m, 1/8", 80/100 mesh)
GC Oven		
Temperature	at 1 min -40°C to 120°C at 200°C/min and 120 to 200 at 50°C/min for 15 min	
Injector C: PK		
Temperature	40°C	
Carrier Gas	Helium	
Maximum Pressure	2 bar	
Flow	20 ml/min	
Detector B : Channel B		
Temperature	280°C	
Aux C Flow (N$_2$)	25 ml/min	
H$_2$ Flow	40 ml/min	
Air Flow	280 ml/min	
Auxiliary Pressure		
AUX Gas 2	1 bar	
AUX Gas 3	0.1 bar	
Auxiliary Temperature		
Aux temp 1 - Aux oven temp	n/a	
Aux temp 2 - Methanizer	380°C	

TRACE IMPURITIES ANALYSIS

DGA-009
Trace Impurities Gas Analyzer for CO, CO_2, and Hydrocarbons

DGA-009 is a dual-channel system for the simultaneous and proper separation and analysis of CO, CO_2, and Hydrocarbons.
Hydrocarbon analysis is performed using a Packed Injector (PK), packed columns and a Flame Ionization Detector (FID).
A second channel is equipped with a Packed Injector (PK), packed columns and a Flame Ionization Detector (FID);
a Methanizer is present on this channel for the determination of CO and CO_2.
The system is configured with one 8-port valve located in the GC auxiliary oven, used for sampling CO and CO_2 on channel A.

DANI DGA-009 is the ready-to-go solution to attain the maximum performance in the shortest time for your analysis of Hydrocarbons and CO CO_2

Master DGA-009

SAMPLE TYPE:
Gas

TYPICAL DETECTED COMPOUNDS:
Hydrocarbons from C_{14} to C_{16}, CO, and CO_2.

OFFICIAL METHODS MET:
UOP 603

KEY FEATURES & BENEFITS:
Accurate and efective determination of CO and CO_2 at ppm levels;

Reliable and precise detection and determiantion of hydrocarbons from C_{14} to C_{16};

Channel A is dedicated to the analysis of CO and CO_2 and it's equipped with a 8-port valve, the Methanizer and an FID Detector;

The Methanizer enables the FID to detect low levels of CO and CO_2;

Hydrocarbon analysis is performed through channel C that includes a PK injector, a capillary column and an FID detector;

All the analytical parameters can be controlled by the DDS Clarity™ Chromatography Station Software;

CO and CO₂ analysis.
FID A chromatogram of the CO and CO2 standard mixture. It is possible to see the peaks of CO, CH4, CO₂.

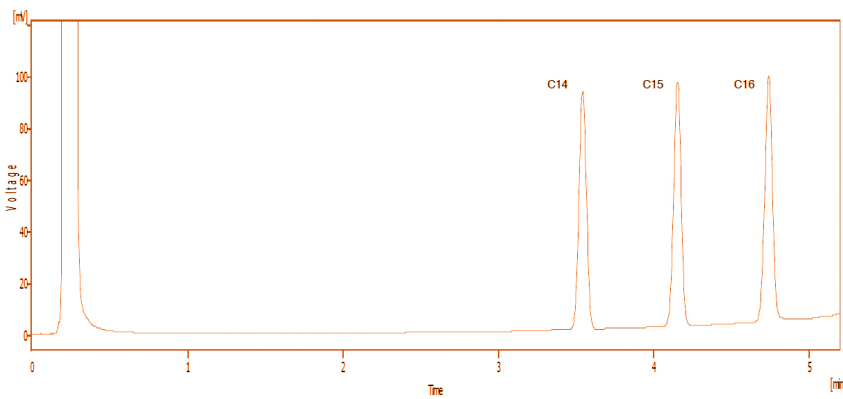| EXPERIMENTAL PARAMETERS FOR CO AND CO₂ ANALYSIS		
Master GC Analyzer		
Columns	Channel A	Hayesep R (2.5m, 1/8", 80/100 mesh) Hayesep R (1m, 1/8", 80/100 mesh)
GC Oven		
Temperature	at 5 min -35°C to 200°C at 20°C/min for 10 min	
Injector A: PK		
Temperature	200°C	
Carrier Gas	Helium	
Maximum Pressure	2 bar	
Flow	20 ml/min	
Detector A : Channel A		
Temperature	280°C	
Aux C Flow (N₂)	25 ml/min	
H₂ Flow	40 ml/min	
Air Flow	280 ml/min	
Auxiliary Pressure		
AUX Gas 2	1.3 bar	
AUX Gas 3	0.1 bar	
Auxiliary Temperature		
Aux temp 1 - Aux oven temp	80°C	
Aux temp 2 - Methanizer	380°C	

Hydrocarbons Analysis.
FID chromatogram of the Hydrocarbons standard mixture. It is possible to recognize the solvent peak, hexane, and the three compounds of the standard mixture: tetradecane, pentadecane and hexadecane.

EXPERIMENTAL PARAMETERS FOR HYDROCARBON ANALYSIS		
Master GC Analyzer		
Columns	Channel C	EC-1 (10m, 0.53mm, 2.65μm)
GC Oven		
Temperature	at 1 min 100°C to 210°C at 20°C/min	
Injector B: PK		
Temperature	200°C	
Carrier Gas	Helium	
Maximum Pressure	n/a	
Flow	20 ml/min	
Detector C : FID C		
Temperature	280°C	
Aux A Flow (N₂)	25 ml/min	
H₂ Flow	40 ml/min	
Air Flow	280 ml/min	
Auxiliary Temperature		
Aux temp 1 - Aux oven temp	80°C	

TRACE IMPURITIES ANALYSIS

DGA-013
Natural Gas Analyzer for CO, CO$_2$ and Hydrocarbons

The DGA-013 Analyzer is a dual-channel system for the analysis of hydrocarbons and CO, CO$_2$.
The analysis of hydrocarbons is performed using a packed injector (PK), capillary columns and a Flame Ionization Detector (FID).
For the analysis of CO and CO2, the Analyzer includes a second channel equipped with a packed injector (PK), packed columns and a Flame Ionization Detector (FID). On this second channel a Methanizer is present to allow the determination of CO and CO$_2$ using the FID detector.

DANI DGA-013 is the ready-to-go solution to attain the maximum performance in the shortest time for your analysis of CO, CO$_2$ and Hydrocarbons

Master DGA-013

SAMPLE TYPE:
Gas

TYPICAL DETECTED COMPOUNDS:

OFFICIAL METHODS MET:
UOP 603, ASTM 2505

KEY FEATURES & BENEFITS:
The DGA-013 Analyzer can determine CO and CO$_2$ in a hydrocarbon mixture and separate the components from C2 using a backflush on Channel A;

A solenoid valve and an auxiliary gas system allow to backflush the hydrocarbons (except methane);

Hydrocarbon analysis is performed using the Channel C that includes a 6-port valve, a PK Injector, a capillary column and the FID detector;

All the analytical parameters can be controlled by the DDS Clarity™ Chromatography Station Software;

DGA 013
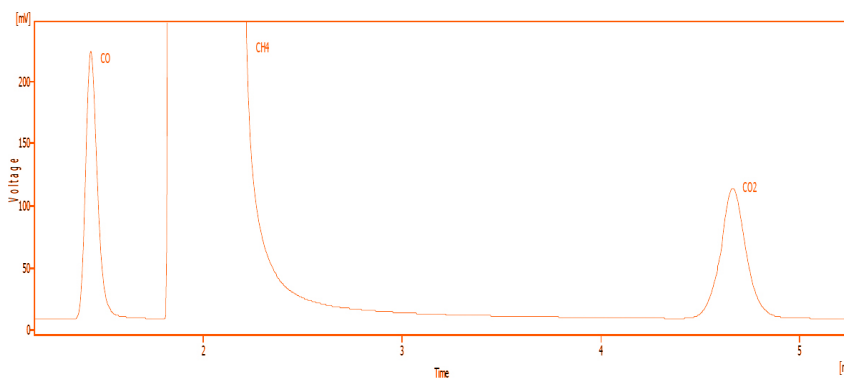
CO and CO₂ analysis.
FID A chromatogram of the CO and CO2 standard mixture. It is possible to see the peaks of CO, CH4, CO₂.

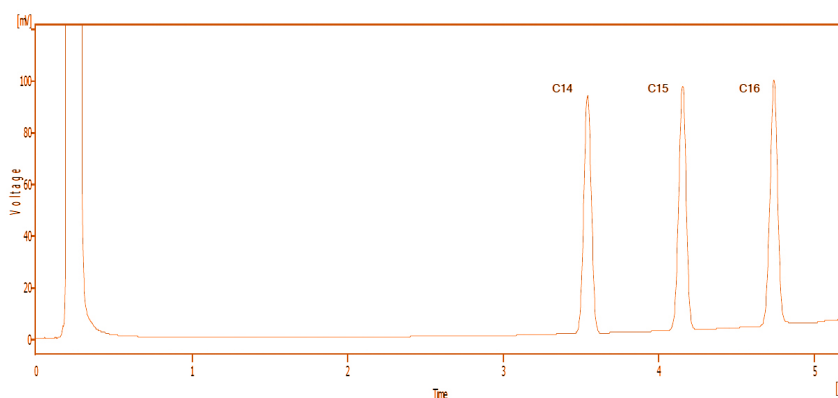| EXPERIMENTAL PARAMETERS FOR CO AND CO₂ ANALYSIS CHANNEL A		
Master GC Analyzer		
Columns	Channel A	Hayesep R (2.5m, 1/8", 80/100 mesh) Hayesep R (1m, 1/8", 80/100 mesh)
GC Oven		
Temperature	at 10 min 35°C to 200°C at 20°C/min for 10 min	
Injector A: PK		
Temperature	200°C	
Carrier Gas	Helium	
Maximum Pressure	2 bar	
Flow	20 ml/min	
Detector A : channel A		
Temperature	350°C	
Aux C flow (N₂)	25 ml/min	
H₂ flow	40 ml/min	
Air flow	280 ml/min	
Auxiliary Temperature		
Aux Temp 1 - Aux Oven Temp	80°C	
Aux Temp 2 - Aux Oven Temp	380°	
Auxiliary Pressure		
AUX Gas 1	1.8 bar	
Aux Gas 2	0.1 bar	

Hydrocarbons Analysis.
FID chromatogram of the Hydrocarbons standard mixture. It is possible to recognize the solvent peak, hexane, and the three compounds of the standard mixture: tetradecane, pentadecane and hexadecane.

EXPERIMENTAL PARAMETERS FOR HYDROCARBONS ANALYSIS CHANNEL C		
Master GC Analyzer		
Columns	Channel C	EC-1 (10m, 0.53mm, 2.65µm)
GC Oven		
Temperature	35°C for 6 min	
Injector B: PK		
Temperature	40°C	
Carrier Gas	Helium	
Maximum Pressure	n/a	
Flow	5 ml/min	
Detector C : FID C		
Temperature	300°C	
Aux A flow (N₂)	25 ml/min	
H₂ flow	40 ml/min	
Air Flow	280 ml/min	
Auxiliary Temperature		
Aux temp 1 - Aux oven temp	80°C	

TRACE IMPURITIES ANALYSIS

DGA-019
DANI Gas ANalyzer for Trace Levels of N_2 n O_2

The DGA-019 Analyzer enables the analysis of oxygen at ppm level in a mixture with nitrogen; the analysis is performed using a Split/Splitless injector, capillary columns and a PDID detector (Pulsed Discharge IonizationDetector).
Moreover, the gas chromatograph is configured with two valves for gas sampling and switching: two 6-port valve located in the GC auxiliary oven.
Two auxiliary gas currents are installed on the instrument to provide an He current on the PDID head and a second He current to purge the 6-port valves.

DANI DGA-019 is the ready-to-go solution to attain the maximum performance in the shortest time for your analysis of Natural Gas

Master DGA-019

SAMPLE TYPE:
Gas

TYPICAL DETECTED COMPOUNDS:
O_2, N_2;

**KEY FEATURES & BENEFITS:**

Oxygen gas analysis is performed using the system that includes an SLIN injector, two 6-port valves, capillary columns and a PDID detector;

With this instrument it is possible to determine these compounds in a gas mix where the Oxygen has a low concentration (ppm level).

All the analytical parameters can be controlled by the DDS Clarity™ Chromatography Station Software;

DGA 019
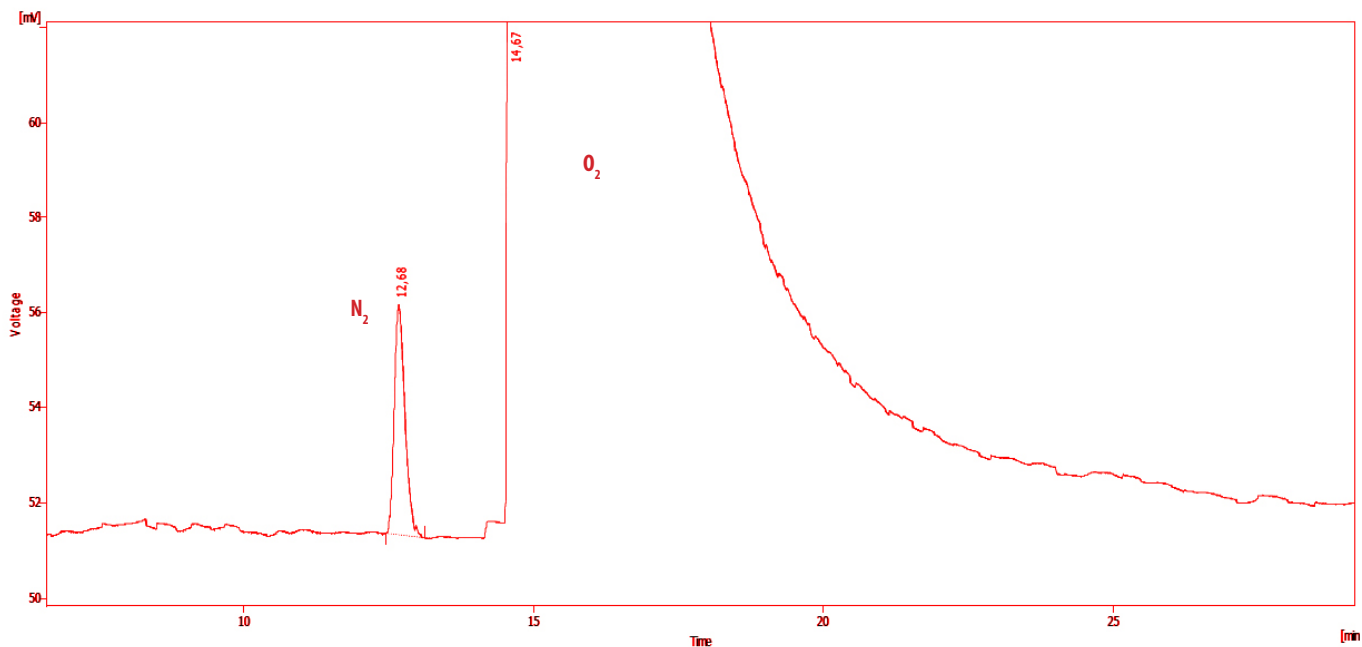
PDID chromatogram of the Gas standard mixture. It is possible to identify the peaks of O_2, N_2.

EXPERIMENTAL PARAMETERS		
Master GC Analyzer		
Columns	Channel A	**Poraplot Q** (50m, 0.32mm ID, 10μm) **Molsieve 5A** (50m, 0.32mm ID, 30μm)
GC Oven		
Temperature	70°C for 30 min T max oven: 250°C	
Injector B: SL/IN		
Temperature	250°C	
Carrier Gas	Helium	
Split Ratio	1:2	
Flow	5 ml/min	
Detector : PDID		
Temperature	140°C	
Attenutation	1	
Mode	PDHID	
Range	1x	
Aux Temperature		
Aux Temp 1 (°C) - Aux OVen Temp	80°C	
Aux Pressure		
Aux Gas 1	4 bar	
Aux Gas 2	0.5 bar	

TRACE IMPURITIES ANALYSIS

DGA-020
Trace Impurities Gas Analyzer for Ar and O_2

The DGA-20 Analyzer enables the analysis of Ar and O_2 which is performed using a Packed (PK) injector, packed column and a TCD detector.
Moreover, the gas chromatograph is configured with one 6-port valve for gas sampling located in the GC oven.
The GC oven is also equipped with a Cryogenic system that allows a better separation of Ar and O2 .

DANI DGA-020 is the ready-to-go solution to attain the maximum performance in the shortest time for your analysis of Ar and O_2

Master DGA-020

SAMPLE TYPE:

TYPICAL DETECTED COMPOUNDS:
Ar, O_2 ;

OFFICIAL METHODS MET:

KEY FEATURES & BENEFITS:

Ar and O_2 analysis is performed using the channel A that includes a PK injector, one 6-port valve, packed column and a TCD detector;

With this instrument it is possible to separate Ar and O_2 in a gas mix using a molesieve column and a Cryogenic system that allows the temperature to decrease below zero;

All the analytical parameters can be controlled by the DDS Clarity™ Chromatography Station Software;
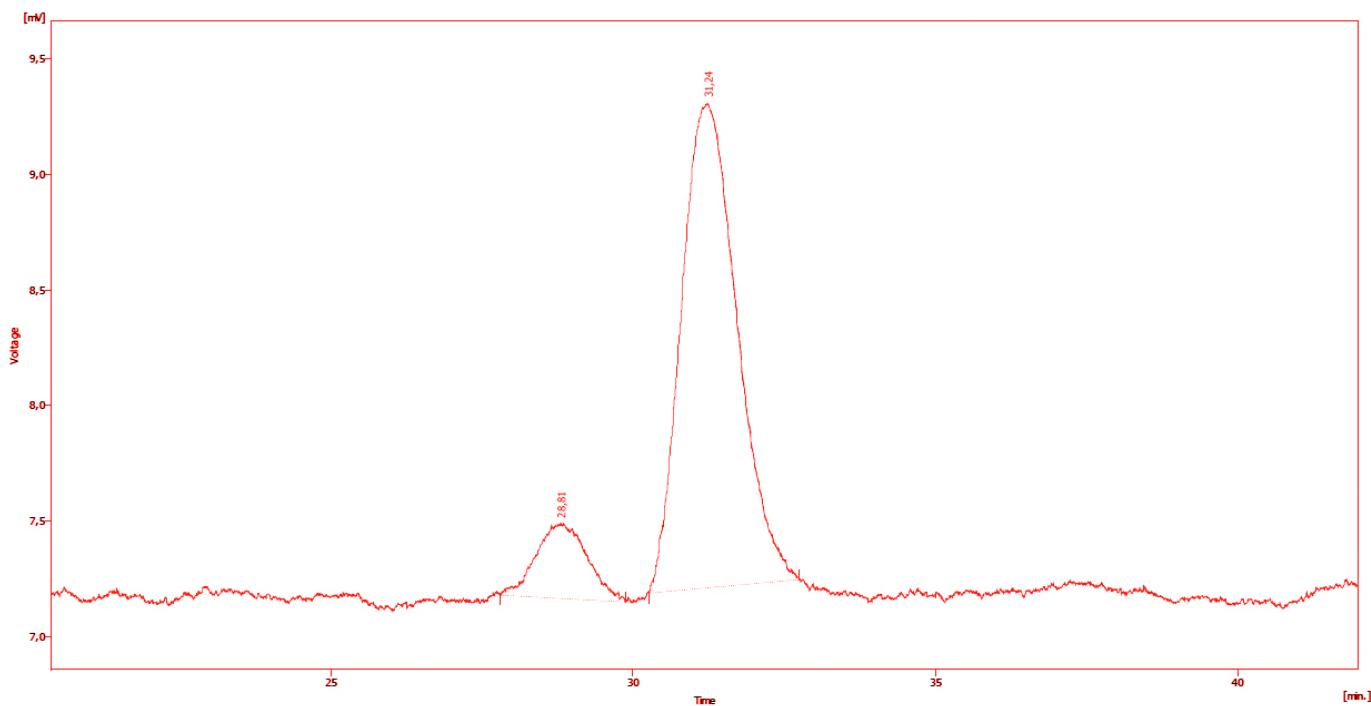
EXPERIMENTAL PARAMETERS		
Master GC Analyzer		
Columns	Channel A	**Hayesep Q** (2m, 2 mm ID, 4mm OD, 80/100 mesh) **Molsieve 5A** (25m, 2 mm ID, 4mm OD, 80/100 mesh)
GC Oven		
Temperature	at 24 min 40°C to 200°C at 20°C/min for 20 min	
Injector B: PK		
Temperature	200°C	
Carrier Gas	Helium	
Max Pressure	2 bar	
Flow	10 ml/min	
Detector A : TCD		
Temperature	250°C	
Volatage	7 V	
Polarity	Negative	
Max Current	180 mA	
Filament Safety	Injector B	
Filament Safety	Aux Gas 1	
Aux Gas		
Aux Gas 1	0.4 bar	

TRACE IMPURITIES ANALYSIS

По вопросам продажи и поддержки обращайтесь:

Архангельск (8182)63-90-72
Астана (7172)727-132
Астрахань (8512)99-46-04
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Смоленск (4812)29-41-54

Сочи (862)225-72-31
Ставрополь (8652)20-65-13
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Томск (3822)98-41-53
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Ярославль (4852)69-52-93

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