chrozen

ASTM D1945 Player

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Россия +7(495)268-04-70 Казахстан +7(7172)727-132 Киргизия +996(312)96-26-47

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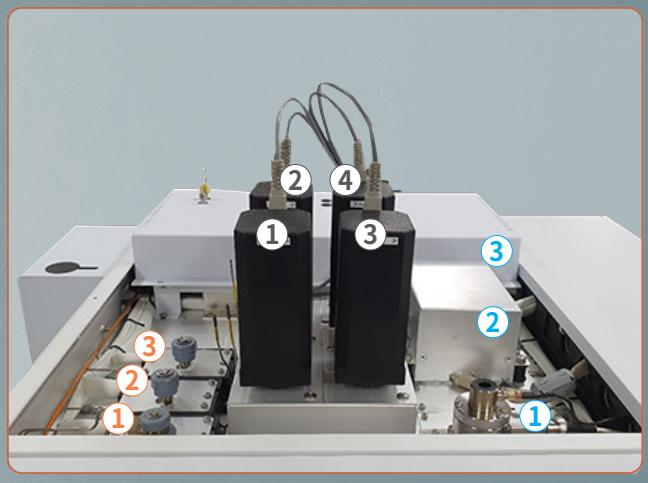
Natural gases consist of methane (major component), other hydrocarbons and permanent gases like hydrogen, oxygen, nitrogen, carbon monoxide as well as carbon dioxide. They are used as major energy sources in numerous industries and it is very critical to accurately determine them because their value differs depending on chemical composition and the concentration of each component. Among various analytical methods for natural gases, ASTM D1945 utilizes Gas Chromatograph (GC) configuring 5 columns and 3 detectors with 4 valves, which enables the analysis of complex natural gases in a single injection. ChroZen ASTM D1945 Player with column switching valve system effectively analyzes natural gases by controlling the valve switching time with accuracy and precision and verifies its reliability by effectively determining each component of natural gases according to ASTM D1945.



1 Capillary Inlet
2 Packed Inlet
3 Packed Inlet

1 Flame Ionization Detector(FID)
2 Thermal Conductivity Detector(TCD)
3 Thermal Conductivity Detector(TCD)

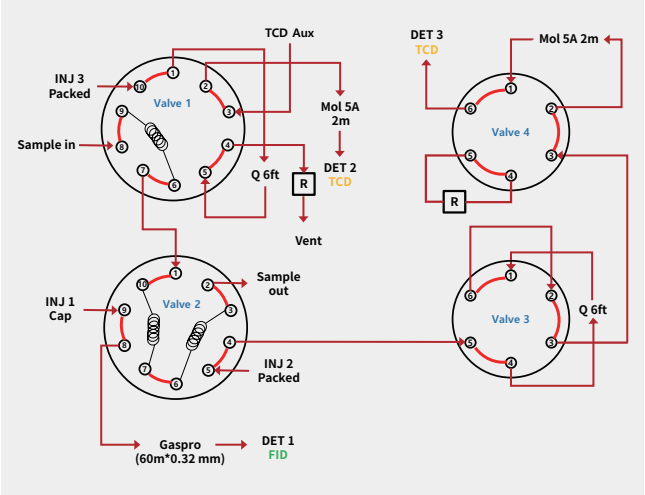
1 Valve 1
2 Valve 2
3 Valve 3
4 Valve 4

Summary of Test Method

As instructed by the standard method for Natural Gas Analysis (NGA), ASTM D1945, the analysis is conducted by ChroZen ASTM D1945 Player with 3 detectors (1 FID and 2 TCDs), 5 columns (Molesieve 5A/Porapak Q/Gaspro) and switching valve system.

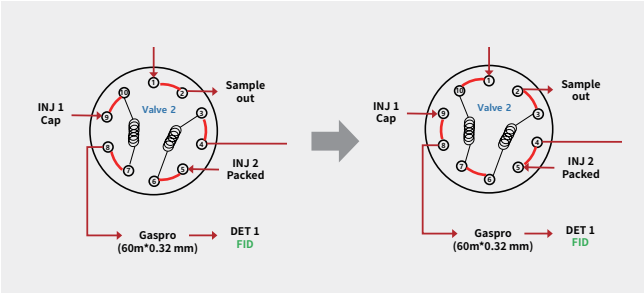
Valve 1 Switching Time Setting

1. The sample is loaded in the sample loop installed on the Valve 1. (Valve 1-Off)
2. Turn the Valve 1 to on-positon at 0.1 min after the analysis run to transfer the sample loaded in the sample loop to Porapak Q column and then Molsieve 5A column to be detected by TCD. (Valve 1-On)
3. After H_2 compound completely eluted from the molsieve column, turn the valve 1 to off -positon to vent the hydrocarbon groups remained in Porapak Q column not to be transferred to Molsieve 5A column. (Valve 1- Off)



Valve Diagram of Natural Gas Analysis

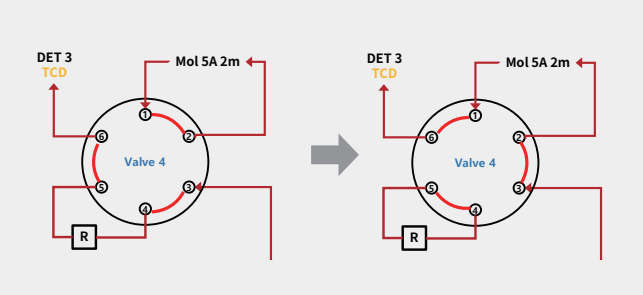
Valve 2 Switching Time Setting



There are 2 sample loops installed in Valve 2 and same samples are loaded in each sample loop. Set the valve switching time to On position at 0.1min. (Valve 2-On)

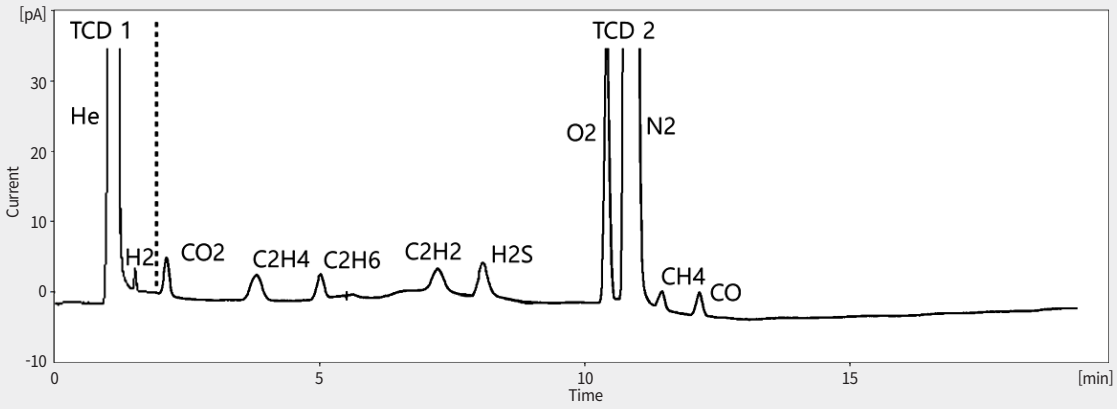
Valve 3, 4 Switching Time Setting

1. When the sample loaded in the sample loop on Valve 2 is injected 0.1 min after analysis run, it is transferred to Porapak Q column connected with Valve 3. (Valve 3-Off) The compounds eluting after CO_2 are remained in Porapak Q column while others such as He, H_2, O_2, N_2, CH_4 and CO are co-eluted in advance.
2. He, H_2, O_2, N_2, CH_4 and CO are transferred to Molsieve 5A column with Valve 4 and separated in it. It's important to switch the flow right after H_2 elution and trap O_2, N_2, CH_4 and CO in Molsieve 5A column. (Valve 4-On)
3. It requires high oven temperature to elute heavy hydrocarbons like C_2H_6 from Porapak Q column but this high temperature might cause co-elution of O_2, N_2, CH_4 and CO in Molsieve 5A column connected to Valve 4. So, C_2H_6 and H_2S need to be back-flushed at the relatively low temperature. (Valve 3-On)

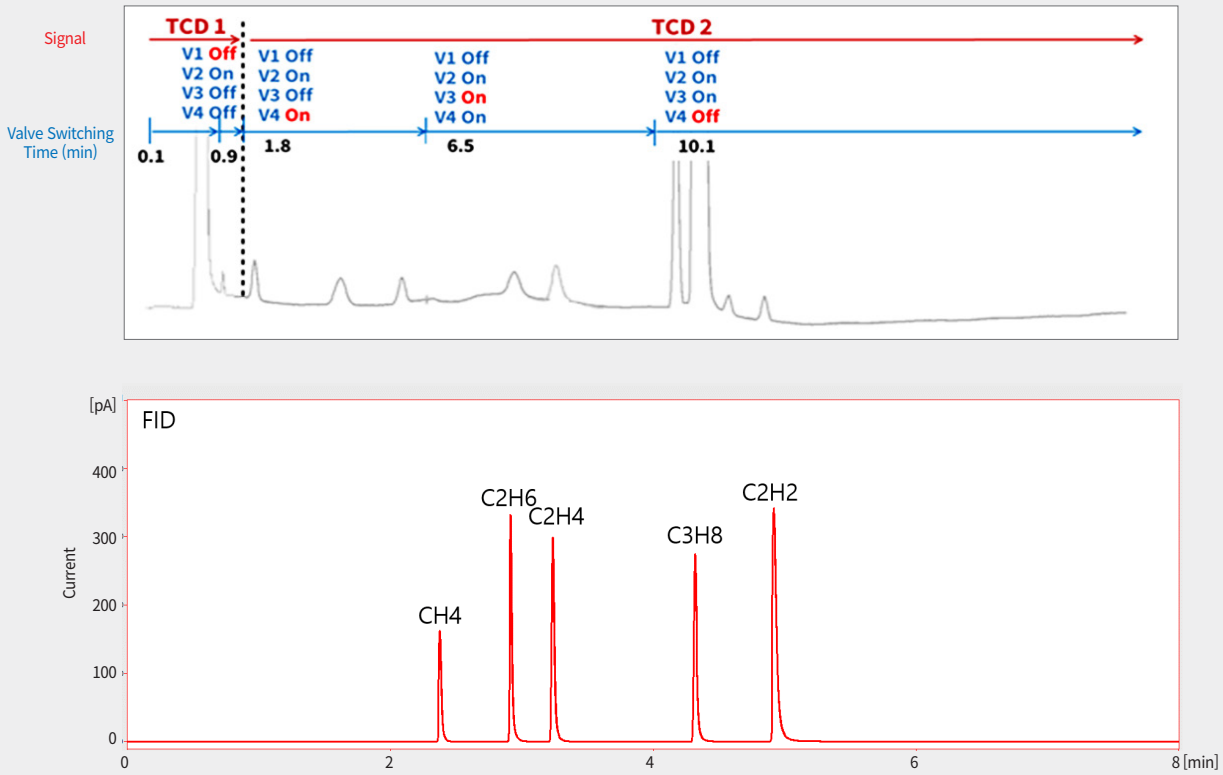


4. After that, turn the Valve 4 off-position to separate O_2, N_2, CH_4 and CO in Molsieve 5A column to be detected by TCD.

Gas mixture analysis



Chromatogram of Natural Gas Mixture



These results show complete separation and detection of each compound in natural gas mixture by ChroZen ASTM D1945 Player configuring 5 columns and 3 detectors with 4 valves according to ASTM D1945.

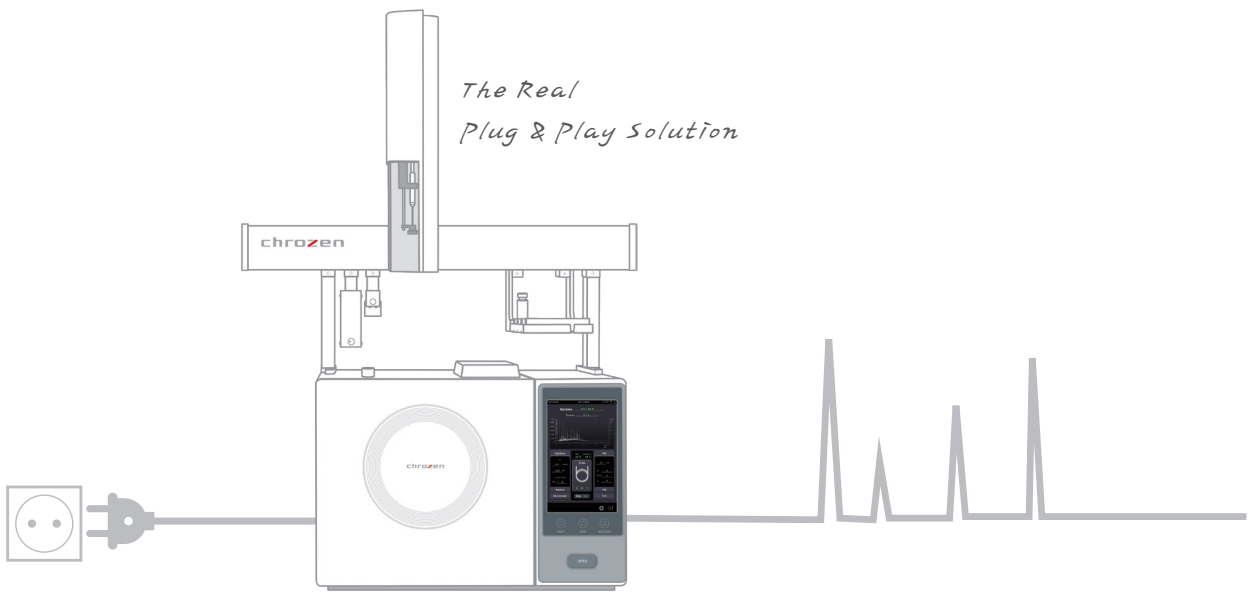
Also, it's easy to modify the valve configuration depending on the target gaseous sample and figure out the optimized valve switching time.
ChroZen ASTM D1945 Player verifies the right solution for superior resolution and sensitivity of components in natural gases within the range of composition shown in ASTM D1945.

ChroZen ASTM D1945 Player

Total Dream Solution includes:

1. Smart Hardware Platform (Utilizing ChroZen GC)
2. Smart Software Control (Chromatography Data System)
3. All Related Consumables and Accessories
4. Columns
   - GS-gaspro 60 m 0.32 mm (1ea)
   - 2m 1/8 2mm MOLECULAR SIEVE 5A 60/80 (2ea)
   - 6Ft Porapak Q 60/80 SS (2ea)
5. The Real Plug & Play Solution
   - QC Report according to the specified application
   - Method Set-Up & File Embedded
   - Specified Easy Manual

Target Compound Coverage	Mol%
Helium	0.01 to 10
Hydrogen	0.01 to 10
Oxygen	0.01 to 20
Nitrogen	0.01 to 100
Carbon dioxide	0.01 to 20
Methane	0.01 to 100
Ethane	0.01 to 10
Hydrogen Sulfide	0.3 to 30
Propane	0.01 to 100
Isobutene	0.01 to 10
n-Butane	0.01 to 10
neoPentane	0.01 to 2
isoPentane	0.01 to 2
n-Pentane	0.01 to 2
Hexane isomers	0.01 to 2
Heptanes plus	0.01 to 1



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