

# Permanent gases and CO<sub>2</sub>

## Fast analysis of permanent gases and CO<sub>2</sub> using coupled tandem PLOT columns

### Application Note

Environmental

#### Authors

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#### Introduction

A parallel setup of two PLOT columns is tuned for separation of permanent gases in a short time. The sample is injected via a normal injection port and is split into the parallel setup of two columns. In this application a short Agilent PoraBOND Q is used to separate the CO<sub>2</sub> (and methane) from the permanent gases (first peak composite) before the first peak (helium) elutes from the Agilent CP-Molsieve PLOT column. After helium, all other permanent gases will be separated which include helium, argon, oxygen, xenon, CO and methane. If water is present, it will appear on the PoraBond and will elute after the CO<sub>2</sub> peak.

This analysis is done isothermally and requires a long CP-Molsieve column to separate peakpairs argon-oxygen and helium-neon. The CO<sub>2</sub> and eventually water that enters the Molsieve column will be adsorbed. If the amount of CO<sub>2</sub> or water accumulated on the CP-Molsieve causes a shift of the retention time of the inert gases out of the integration window, the Agilent Select Permanent Gases/CO<sub>2</sub> and water adsorption has very little impact on the retention and many analysis can be done before regeneration is required. As methane elutes from both systems the split ratio between the columns can be calculated by the ratio of the methane peaks. If heavier compounds are present, for instance ethane, ethylene, propane, these components will elute later between the peaks that elute from the CP-Molsieve column. If such a component interferes with a compound that elutes from the Molsieve, the oven temperature must be changed by a few degrees.



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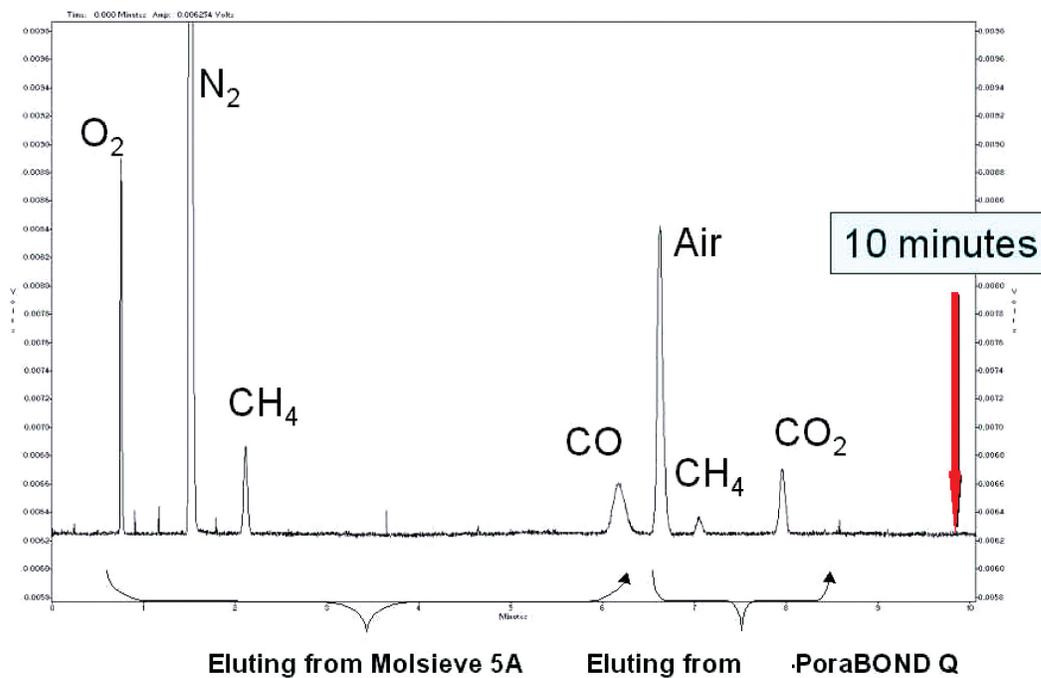
## Conditions

Technique : GC  
Column : Agilent Select Permanent Gases/CO<sub>2</sub>  
Part no. CP7429  
Temperature : 35 °C  
Carrier Gas : Helium, 100 kPa  
Injector : Split 50 mL/min  
Detector : TCD  
Sample Size : 20 µL  
Concentration Range : % level

Courtesy : C. Duvekot, Agilent Application Laboratory,  
Middelburg, The Netherlands

## Peak identification

oxygen  
nitrogen  
methane  
carbon monoxide  
carbon dioxide



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This information is subject to change without notice.

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