



# 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 2 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 2 columns. A short Agilent CP-Molsieve is used to separate the inert gases (helium, oxygen nitrogen, methane and CO) before the first peak (composite peak of all inert gases) elutes from the Agilent PoraBOND Q PLOT column. After the first peak, the methane and CO<sub>2</sub> elute from the PoraBOND Q column. If water is present, we will see that also on the PoraBond.

This analysis is done isothermally and can be speeded up significantly. 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> column can be regenerated by 30 minutes at 300 °C. In practice, we found that CO<sub>2</sub> and water adsorption has very little impact on the retention and many analyses 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.

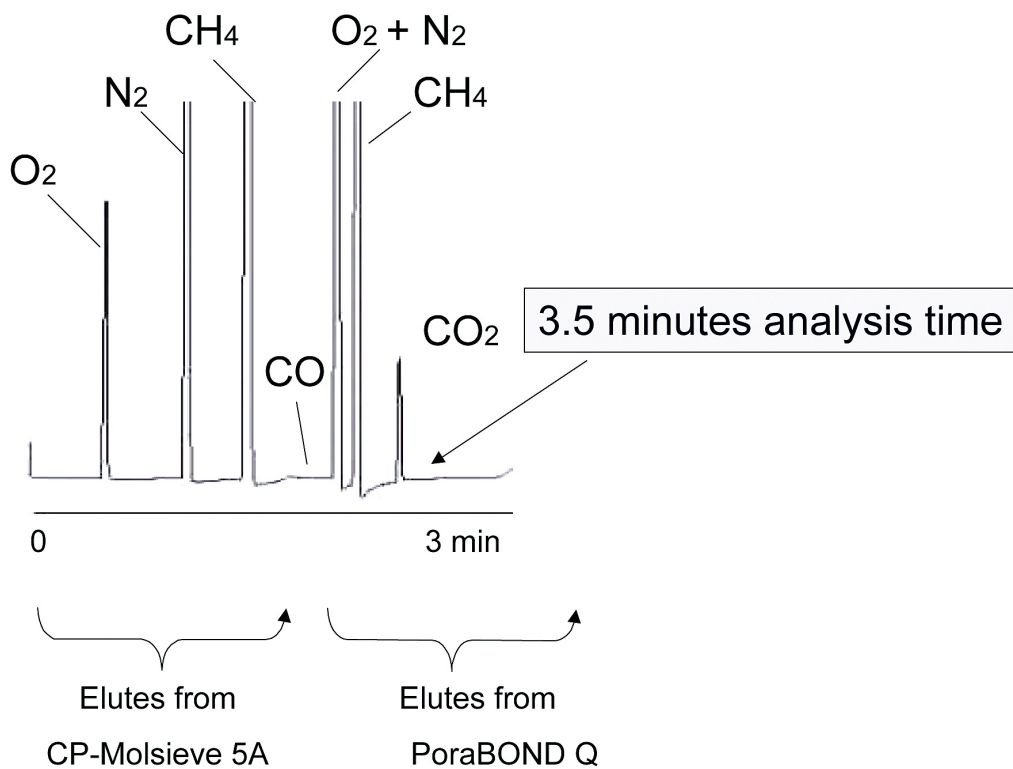


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## Conditions

Technique : GC  
Column : Agilent Select Permanent Gases/ $\text{CO}_2$   
Part no. CP7429  
Temperature : 50 °C  
Carrier Gas : Helium, 100 kPa  
Injector : Split 1:50  
Detector : TCD  
Sample Size : 20  $\mu\text{L}$   
Concentration Range : % level

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



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