

## Gases

# O<sub>2</sub> and water vapor in modified atmosphere packaging for sausages with and without O<sub>2</sub> absorber

## Application Note

Food Testing & Agriculture

### Authors

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### Introduction

A GC method was developed for measuring residual oxygen and the level of relative humidity during the same run in atmosphere packages. The GC system consists of a loop-injector (valve), connected with two capillary columns coupled in series. The Agilent FFAP column was connected to the valve-loop injector and directly to the TCD. The Agilent CP-Molsieve 5Å was connected to the outlet of the TCD by using a Swagelok union and fed back into the other channel of the TCD.

The CP-Molsieve column was kept in a glycol cooling bath at 0-3 °C. By using this set-up the separation of argon-oxygen was possible despite peak broadening occurring in the column and the first transfer through the TCD.

The FFAP column separates the water from the gases, and water can be measured. The CP-Molsieve 5Å column separates the argon, oxygen and nitrogen; to get a positive signal, the polarity of the detector was switched at 2.7 minutes.

Water and carbon dioxide will be adsorbed by the molsieve adsorbent. The adsorbed water and carbon dioxide will eventually reduce the retention and separation power of the molsieve after a number of analyses. In practice, the number of analyses before the molsieve must be regenerated is very high. Regeneration of the molsieve can be done by conditioning the column for a few hours at 250-300 °C to remove water and carbon dioxide.



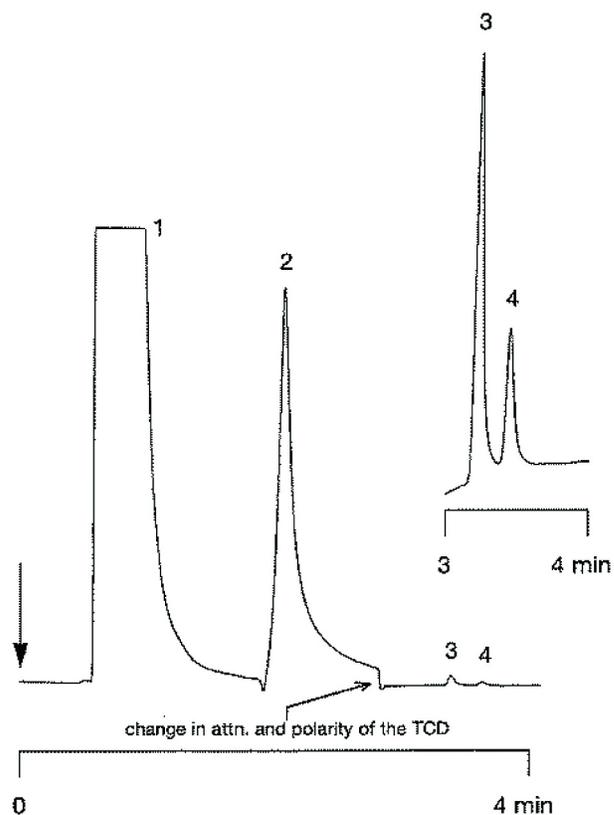
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## Conditions

Technique : GC-wide-bore  
Column 1 : Agilent FFAP type, 0.53 mm x 15 m, fused silica WCOT (df = 1  $\mu$ m) (custom made)  
Column 2 : Agilent CP-Molsieve 5Å, 0.53 mm x 25 m, fused silica PLOT (df = 50  $\mu$ m) (Part no. CP7538)  
Temperature Column 1 : 150 °C  
Temperature Column 2 : 0-3 °C  
Carrier Gas : H<sub>2</sub>, 40 kPa (0.4 bar, 6 psi)  
Injector : Valve injector, 1 mL loop, T = 150 °C  
Detector : TCD, T = 130 °C  
T filaments = 190 °C  
Sample Size : 1 mL

## Peak identification

1. nitrogen + argon + oxygen + nitrogen (+ carbon dioxide)
2. water
3. argon
4. oxygen 0.027%



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