

Solvents

Analysis of impurities in ethanol

Application Note

Materials Testing & Research

Authors

Agilent Technologies, Inc.

Introduction

The fast analysis of impurities in ethanol can be done very well using Agilent 0.15 mm id capillary columns in combination with split injection and FID detection. The 0.15 mm capillary offers a high plate number (ca 150,000/25 m), can be operated with practical pressures (150 - 250 kPa) and can be used for a wide range of different applications. The problem of reduced loadability has been fully overcome by using a thick film Agilent CP-Sil 5 CB (1.2 μm). This allows accurate trace analysis of impurities in many chemical products. Some large chemical companies claim that they can do 85% of all their analyses on just one type of column: a 0.15 mm x 25 m coated with 1.2 μm CP-Sil 5 CB.

The reproducibility of the analysis is within 3% standard deviation, even for compounds which are present at 5 - 500 ppm. Despite split injection, impurities can be measured at 1 - 5 ppm. Typically, a 100% method is used for integration. Ideally hydrogen is used as the carrier gas as analysis time will be shortest. Helium is also very applicable. Typical analysis times are within 10 - 15 minutes.



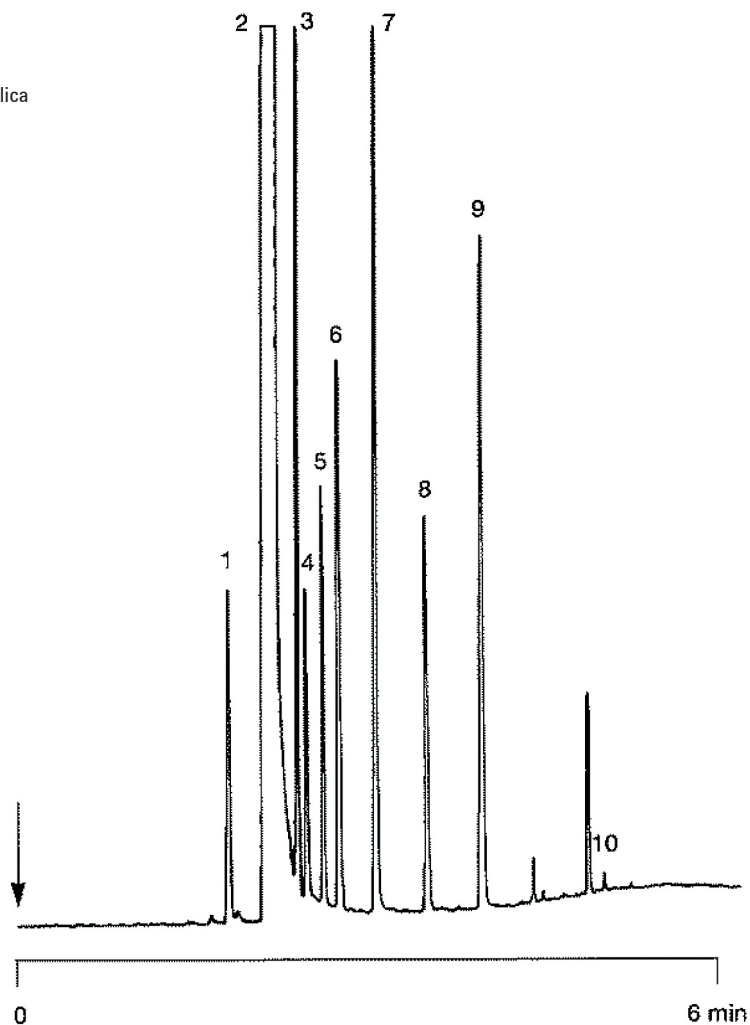
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Conditions

Technique : GC-capillary
Column : Agilent CP-Sil 5 CB, 0.15 mm x 25 m, fused silica
WCOT (df = 1.2 µm) (Part no. CP7693)
Temperature : 70 °C (2 min) → 200 °C, 20 °C/min
200 °C (5 min)
Carrier Gas : H₂, 150 kPa (1.5 bar, 21 psi)
Injector : Split, T = 250 °C
Detector : FID, T = 250 °C
Sample Size : 2.0 µL
Concentration Range : 1-200 ppm
Solvent Sample : ethanol balance

Peak identification

1. methanol	128 ppm
2. ethanol	
3. acetone	228 ppm
4. 2-propanol (isopropanol)	67 ppm
5. diethyl ether	83 ppm
6. 2-methyl-2-propanol (t-butanol)	125 ppm
7. 1-propanol	217 ppm
8. 2-butanone (methyl ethyl ketone)	99 ppm
9. isobutanol	131 ppm
10. impurity	7 ppm



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This information is subject to change without notice.

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