

Alcohols

Analysis of alcohols in blood/plasma

Application Note

Forensics

Authors

Agilent Technologies, Inc.

Introduction

Gas chromatography with an Agilent CP-Sil 19 CB column separates alcohols in blood/plasma in three minutes.



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Conditions

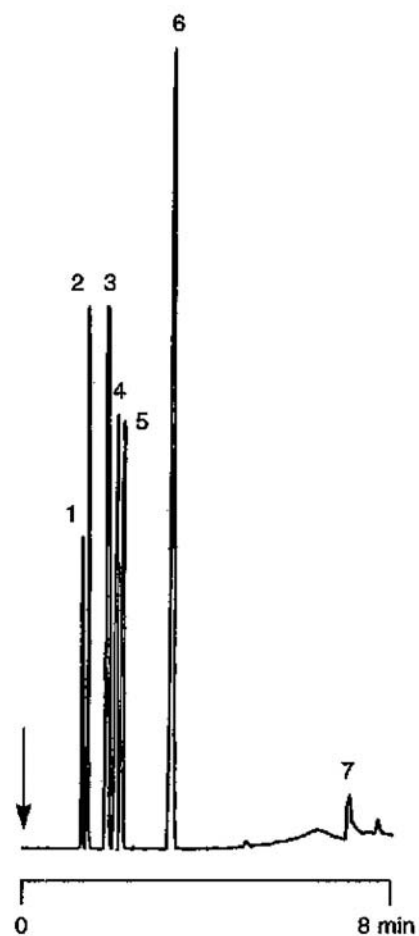
Technique : GC-wide-bore
Column : Agilent CP-Sil 19 CB, 0.53 mm x 25 m fused silica
WCOT CP-Sil 19 CB (df = 2.0 µm) (Part no. CP7657)
Temperature : toxicological screening: 40 °C (3 min) → 100 °C,
20 °C/min samples: 50 °C isothermal
Carrier Gas : N₂, 35 kPa (0.35 bar, 5 psi)
Injector : Splitter, split flow 26 mL/min
T = 220 °C
Detector : FID
T = 200 °C
Sample Size : 0.5 µL
Concentration Range : 0.1 - 0.25 g/L
Solvent Sample : water

Courtesy : R. Klepeštö,
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Peak identification

1. acetaldehyde
2. methanol
3. ethanol
4. acetone
5. 2-propanol
6. 1-propanol (IS)
7. ethylene glycol

Toxicological screening:
stock standard solution + internal standard
Attn 10
0.1 - 0.25 g/L



Sample standard preparation

Dilute 100 µL of standard solution with 100 µL internal standard solution.

Internal standard solution

0.25 g/L 1-propanol in water.

Sample preparation

The blood samples were collected in anti-coagulant (EDTA) containing tubes, closed and centrifuged for 5 minutes at 3000 RPM. 100 µL plasma was taken, mixed with 100 µL internal standard solution (0.25 g/L 1-propanol) and stored in a closed micro sample container. A 5 µL syringe was flushed several times to remove the air in the needle. 0.5 µL of sample was measured in the syringe, the plunger was drawn back at least 3 - 4 µL and the sample was injected manually in the split-injector of the GC.

Remarks

The liner (without glass wool) of the injector must be replaced and cleaned on a regular basis, typically after about 50 injections. Used liners can be cleaned with regular, soft detergents. Do not use aggressive cleaning liquids.

Calculation

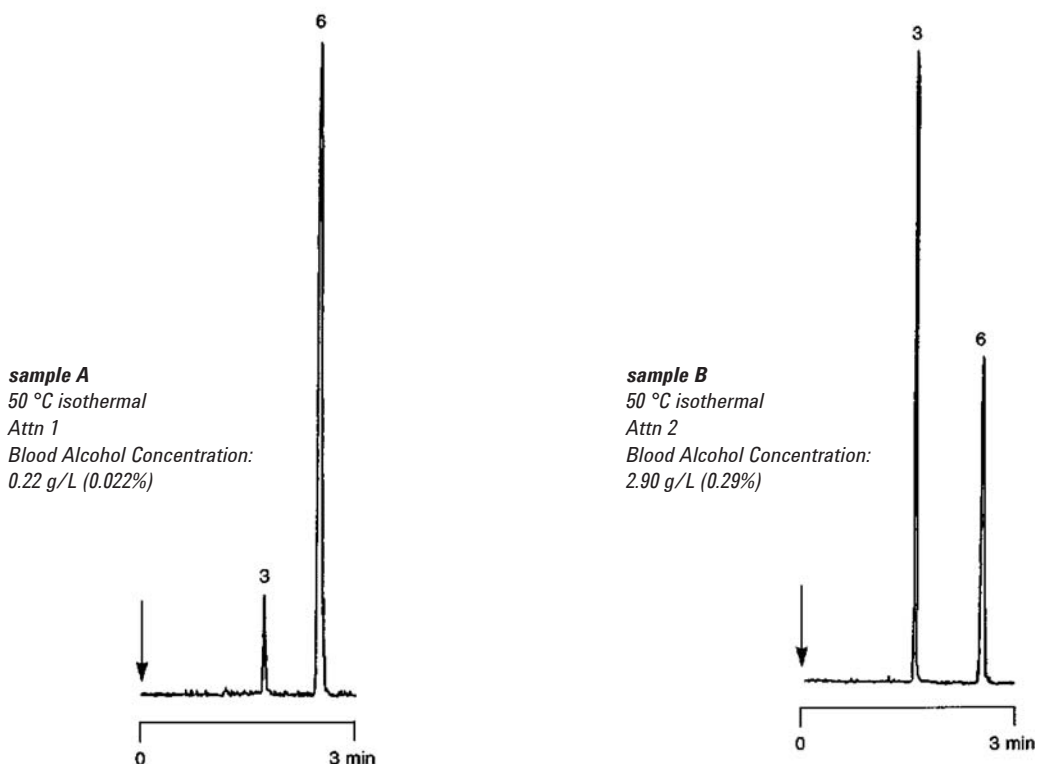
The regular internal standard method calculation can be used. The ethanol concentration of plasma is 1.17 times the concentration in whole blood, so the calculated value for plasma must be corrected by this factor to find the concentration in whole blood.

Detection limits

The detection limits (based on three times the noise level) for methanol and ethanol are both 0.02 g/L.

Peak identification

1. acetaldehyde
2. methanol
3. ethanol
4. acetone
5. 2-propanol
6. 1-propanol (I.S.)
7. ethylene glycol



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This information is subject to change without notice.

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