Oxygenates

Separation of oxygenates in a C_1-C_5 hydrocarbon matrix

Application Note

Energy & Fuels

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Introduction

For the separation of oxygenates in light hydrocarbons a highly polar stationary phase has to be used. TCEP is used widely but has a limited temperature stability. The Agilent Lowox adsorbent provides very high retention for oxygenated compounds. The methanol elutes after n-C_{14} allowing this component to be measured at low levels in a range of hydrocarbon streams (see Application note 1363). To demonstrate the unique selectivity of the Lowox phase, a mixture of a wide range of oxygenates was analyzed. All oxygenates, including the highly volatile aldehydes and ethers, are well separated and elute as sharp symmetrical peaks. Typical applications of trace methanol in hydrocarbons are shown in Application notes 1360 and 1361. The high maximum temperature of 350 °C with virtually no bleed makes the Lowox column widely applicable for long-term reliable analyses.

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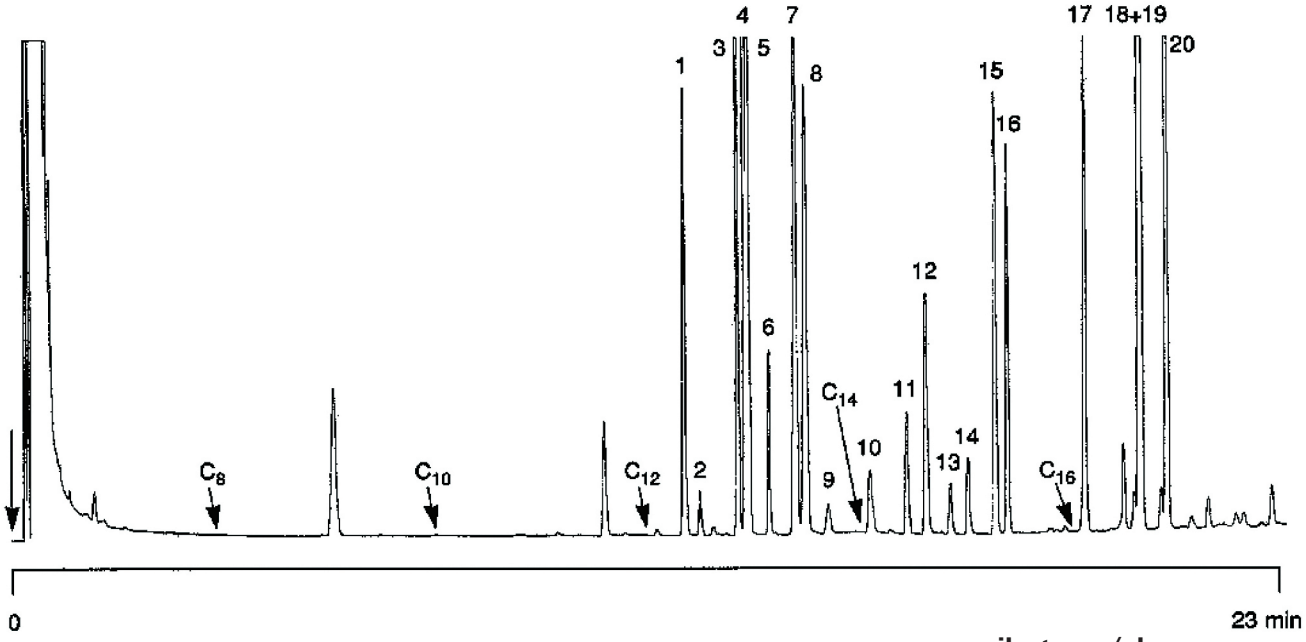
Conditions

Technique	:	GC-wide-bore
Column	:	Agilent Lowox, 0.53 mm fused silica PLOT (Part no. CP8587)
Temperature	:	50 °C (5 min) ⟶ 240 °C, 10 °C/min
Carrier Gas	:	He, 28.8 kPa (0.288 bar, 4.1 psi)
Injector	:	Split, T = 250 °C
Detector	:	FID T = 250 °C
Sample Size	:	1 µL
Concentration Range	:	0.01%
Solvent Size	:	cyclohexane

Peak identification

1. acetaldehyde
2. diethyl ether
3. ethyl tert-butyl ether
4. methyl tert-butyl ether
5. diisopropyl ether
6. propionaldehyde (propanal)
7. tert-amyl methyl ether
8. dipropyl ether
9. isobutyraldehyde
10. butyraldehyde
11. methanol
12. acetone
13. isovaleraldehyde
14. valeraldehyde
15. 2-butanone
16. ethanol
17. 1-propanol
18. 2-methyl-1-propanol (isobutanol)
19. 2-methyl-2-propanol (t-butanol)
20. 1-butanol



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