Separation of Fatty Acid Methyl Esters (FAME) on an Agilent J&W Select CP-Sil 88 for FAME GC Column

Application Note

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Introduction

The routine, detailed separation of fatty acid methyl esters (FAME) requires high polarity liquid phases, which will differentiate between the multiple FAME isomers. The CP-Sil 88 is among the GC columns frequently used for the profiling of complex FAME mixtures. It is based on a stabilized, highly subsituted cyanopropyl siloxane phase and due to its highly polar properties is able to effectively separate on small structural differences of many positional FAME isomers. This application note shows the routine separation of fatty acid methyl esters (FAME) using a Select CP-Sil 88 column and GC-FID resulting in excellent selectivity; all 37 components were resolved in one run.

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Conditions

Technique:	GC-FID
Column:	Select CP-Sil 88 for FAME, 100 m x 0.25 mm df=0.2 µm (part number CP7489)
Oven:	80 °C, 4 °C/min to 220 °C, 5 min, 4 °C/min to 240 °C, 10 min
Carrier Gas:	Helium, constant flow 1.0 mL/min
Injection:	Splitflow 20 mL/min, Temperature = 250 °C
Injection Volume:	0.5 µL
Detection:	FID, 270 °C
Sample:	37 component FAME mix
Sample Solvent:	Dichloromethane
Sample Conc:	2-4% (w/w)

Peak Identification

1. C4:0
2. C6:0
3. C8:0
4. C10:0
5. C11:0
6. C12:0
7. C13:0
8. C14:0
9. C14:1
10. C15:0
11. C15:1
12. C16:0
13. C16:1
14. C17:0
15. C17:1
16. C18:0
17. C18:1 trans 9
18. C18:1 cis 9
19. C18:2, trans 9, 12
20. C18:2 cis 9,12
21. C20:0
22. C18:3 cis 6,9,12 gamma
23. C20:1 cis 11
24. C18:3 cis 9,12,15 alpha
25. C21:0
26. C20:2 cis 11,14
27. C22:0
28. C20:3 cis 8,11,14
29. C22:1 cis 13
30. C20:3 cis 11,14,17
31. C20:4 cis 5,8,11,14
32. C23:0
33. C22:2 cis 13,16
34. C24:0
35. C20:5 cis 5,8,11,14,17 EPA
36. C24:1 cis 15
37. C22:6 cis 4,7,10,13,16,19 DHA

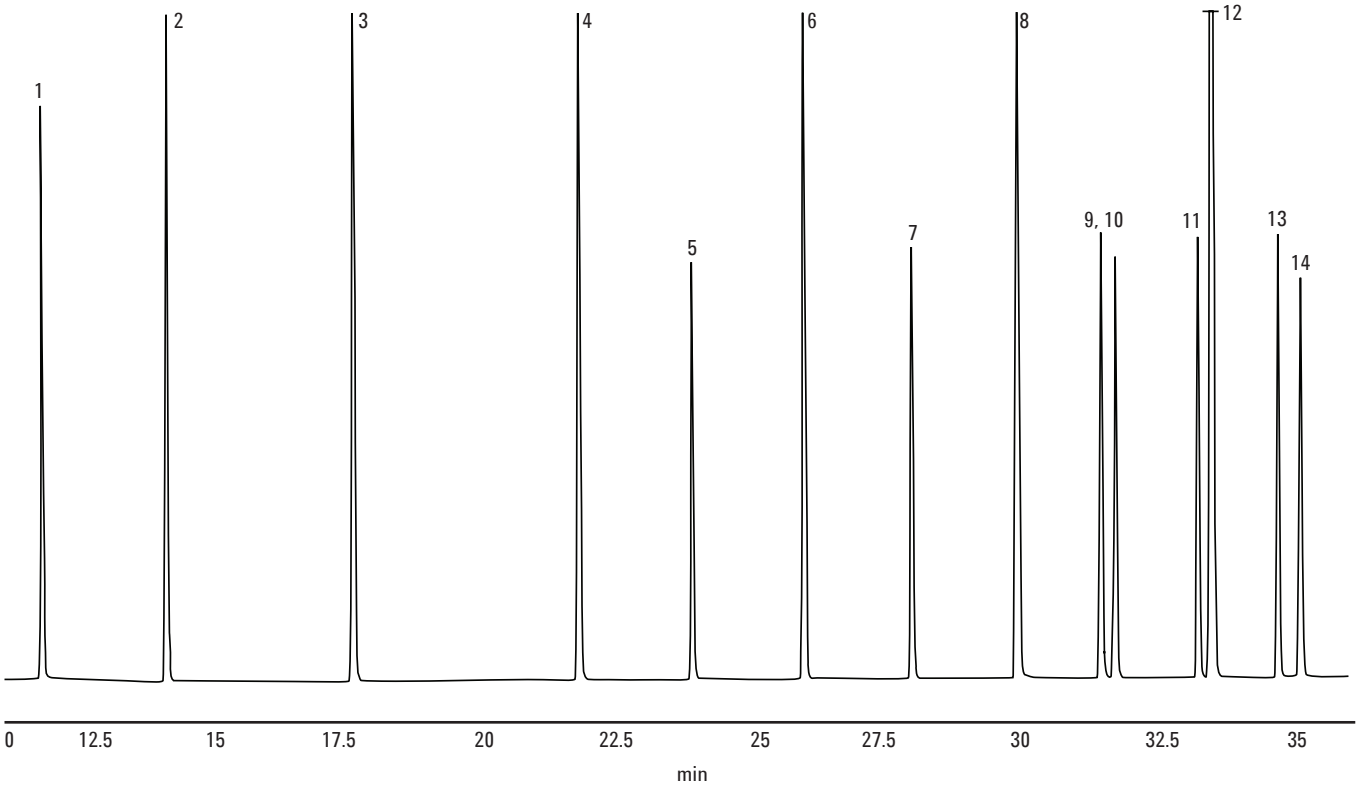

Figure 1a. Separation of a 37 component FAME mix (peaks 1-14)

Peak Identification

1.	*C4:0*
2.	*C6:0*
3.	*C8:0*
4.	*C10:0*
5.	*C11:0*
6.	*C12:0*
7.	*C13:0*
8.	*C14:0*
9.	*C14:1*
10.	*C15:0*
11.	*C15:1*
12.	*C16:0*
13.	*C16:1*
14.	*C17:0*
15.	*C17:1*
16.	*C18:0*
17.	*C18:1 trans 9*
18.	*C18:1 cis 9*
19.	*C18:2, trans 9, 12*
20.	*C18:2 cis 9,12*
21.	*C20:0*
22.	*C18:3 cis 6,9,12 gamma*
23.	*C20:1 cis 11*
24.	*C18:3 cis 9,12,15 alpha*
25.	*C21:0*
26.	*C20:2 cis 11,14*
27.	*C22:0*
28.	*C20:3 cis 8,11,14*
29.	*C22:1 cis 13*
30.	*C20:3 cis 11,14,17*
31.	*C20:4 cis 5,8,11,14*
32.	*C23:0*
33.	*C22:2 cis 13,16*
34.	*C24:0*
35.	*C20:5 cis 5,8,11,14,17 EPA*
36.	*C24:1 cis 15*
37.	*C22:6 cis 4,7,10,13,16,19 DHA*

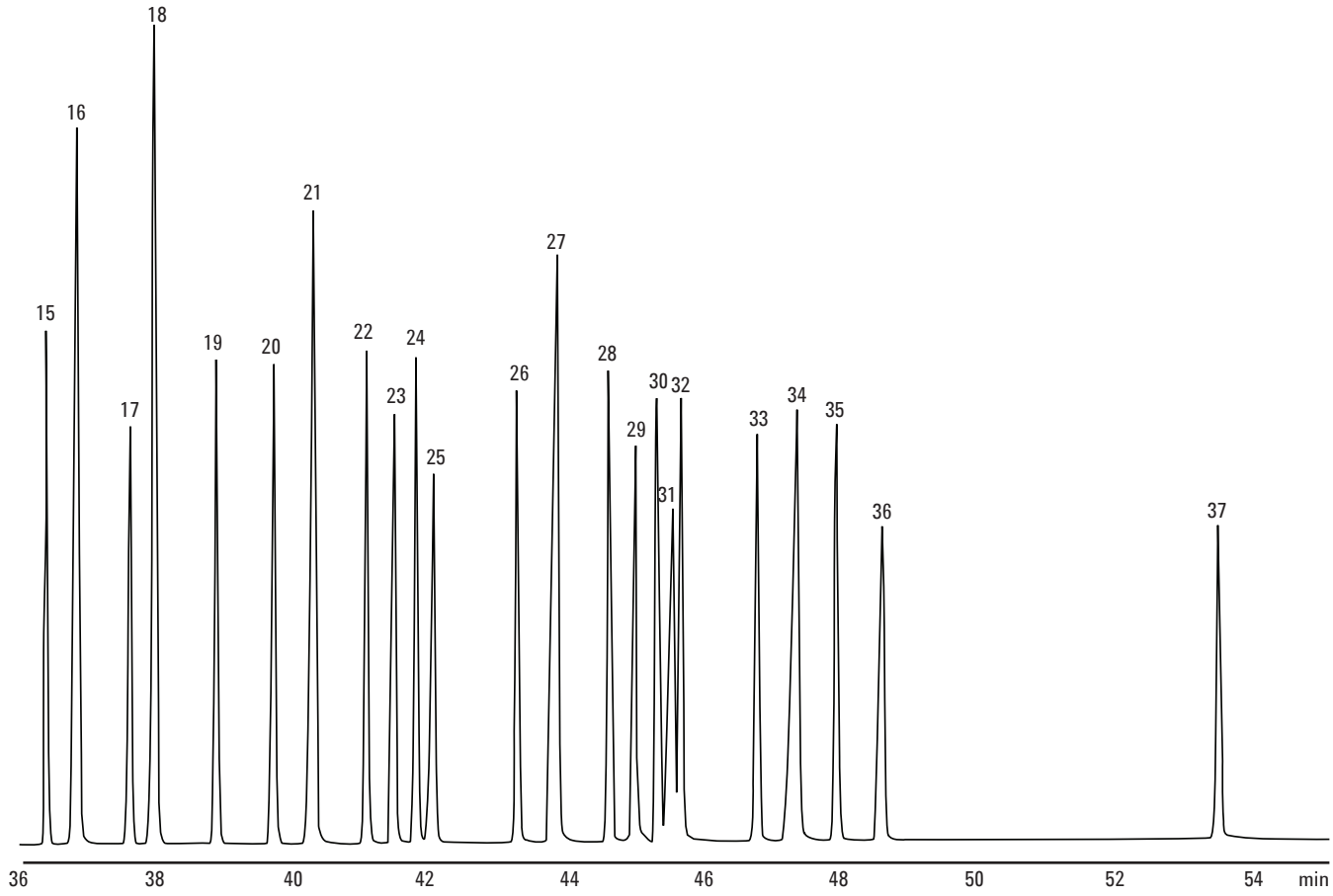

Figure 1b. Separation of a 37 component FAME mix (peaks 15-37)

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Published in UK, October 08, 2010
SI-02178

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