

# 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 substituted 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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| <b>Conditions</b> | <b>Peak Identification</b>  |
|-------------------|---|
| Technique:        | GC-FID  |
| Column:           | Select CP-Sil 88 for FAME,<br>100 m x 0.25 mm df=0.2 µm<br>(part number CP7489)   |
| Oven:             | 80 °C, 4 °C/min to 220 °C, 5<br>min, 4 °C/min to 240 °C, 10<br>min  |
| Carrier Gas:      | Helium, constant flow 1.0<br>mL/min   |
| Injection:        | Splitflow 20 mL/min,<br>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)  |
|                   | 1. C4:0<br>2. C6:0<br>3. C8:0<br>4. C10:0<br>5. C11:0<br>6. C12:0<br>7. C13:0<br>8. C14:0<br>9. C14:1<br>10. C15:0<br>11. C15:1<br>12. C16:0<br>13. C16:1<br>14. C17:0<br>15. C17:1<br>16. C18:0<br>17. C18:1 trans 9<br>18. C18:1 cis 9<br>19. C18:2, trans 9, 12<br>20. C18:2 cis 9,12<br>21. C20:0<br>22. C18:3 cis 6,9,12 gamma<br>23. C20:1 cis 11<br>24. C18:3 cis 9,12,15 alpha<br>25. C21:0<br>26. C20:2 cis 11,14<br>27. C22:0<br>28. C20:3 cis 8,11,14<br>29. C22:1 cis 13<br>30. C20:3 cis 11,14,17<br>31. C20:4 cis 5,8,11,14<br>32. C23:0<br>33. C22:2 cis 13,16<br>34. C24:0<br>35. C20:5 cis 5,8,11,14,17 EPA<br>36. C24:1 cis 15<br>37. C22:6 cis 4,7,10,13,16,19 DHA |

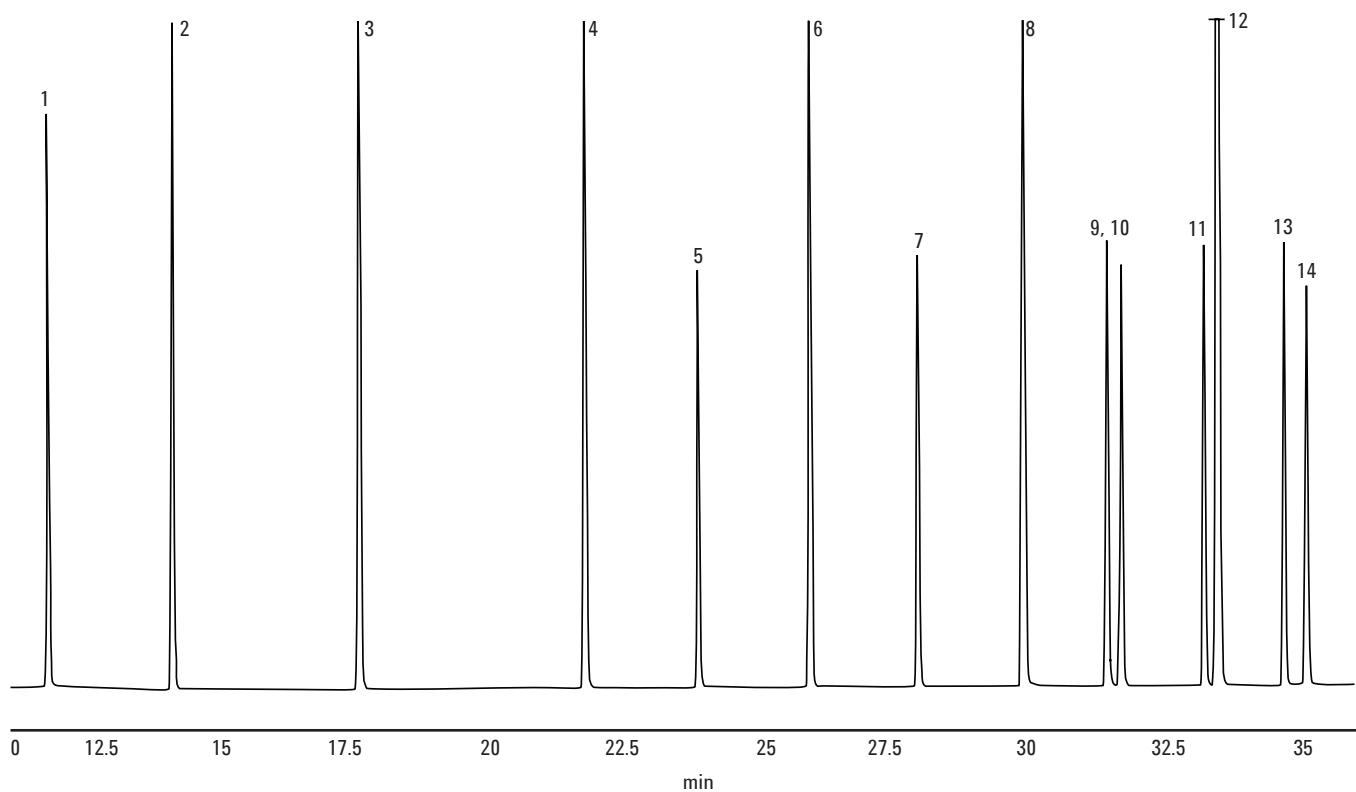


Figure 1a. Separation of a 37 component FAME mix (peaks 1-14)

#### Peak Identification

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

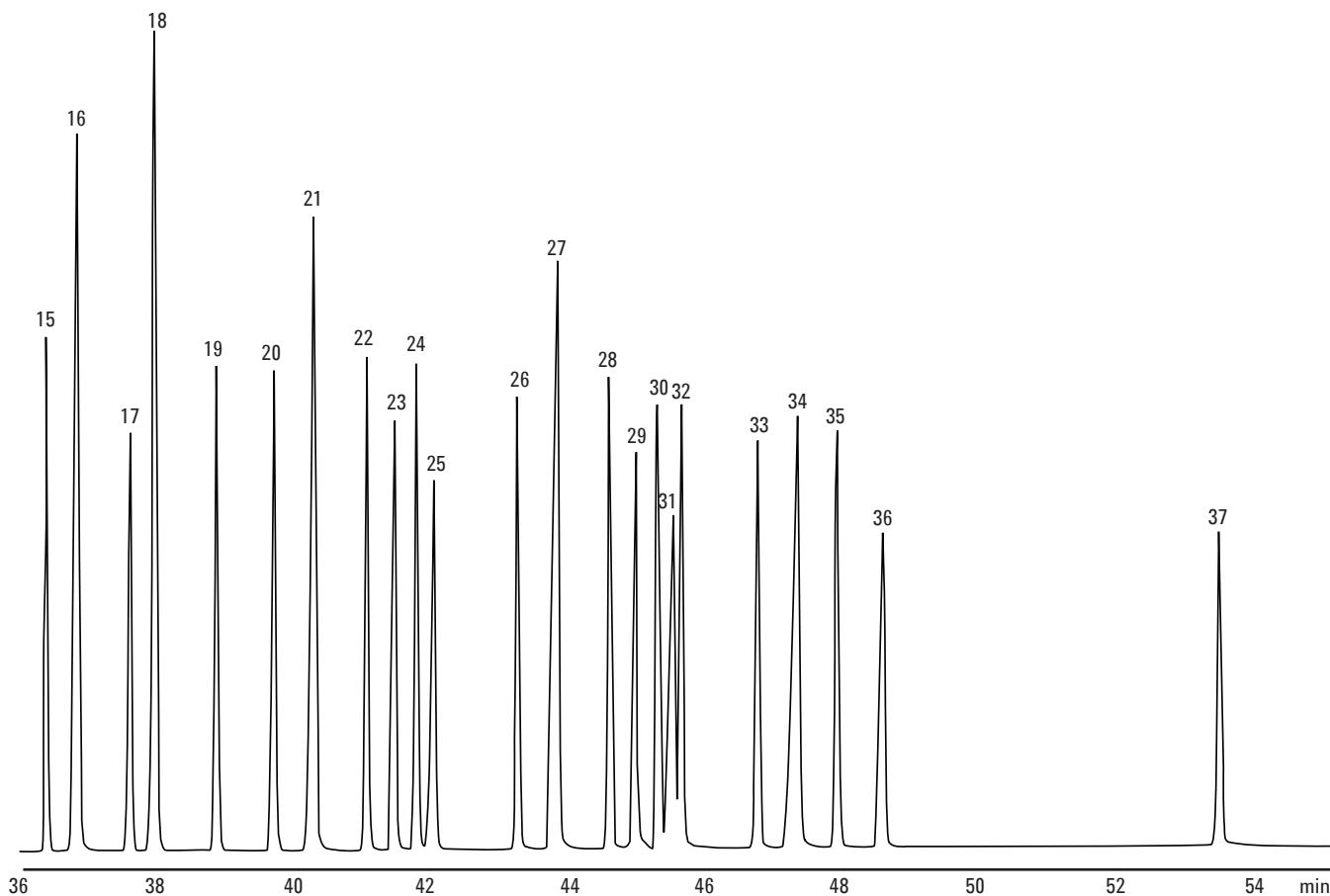


Figure 1b. Separation of a 37 component FAME mix (peaks 15-37)

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This information is subject to change without notice.

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