



Capillary columns for analysis of biodiesel

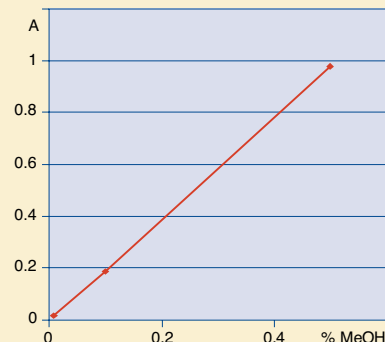
OPTIMA® BioDiesel

for the analysis of biodiesel (DIN EN 14214 / ASTM D 6751)

OPTIMA® BioDiesel M

for analysis of methanol in accordance with DIN EN 14110

The methanol content in biodiesel as specified in DIN EN 14110 must not exceed 0.2%. The column OPTIMA® BioDiesel M allows the GC headspace analysis of the methanol content in biodiesel in the concentration range from 0.01 to 0.5% with 2-propanol as internal standard. The graph on the right shows the linearity of the determination in the required range ($A = \text{area}[\text{methanol}]/\text{area}[\text{2-propanol}]$).
similar phases: Select™ Biodiesel for Methanol, Trace TR-BioDiesel (M)
max. temperature for isothermal operation 340 °C, max. temperature for short isotherms in a temperature programme 360 °C



OPTIMA® BioDiesel F

for analysis of FAMES in accordance with DIN EN 14103

The standard DIN EN 14103 specifies the separation of typical FAMES between myristic acid (C14) and nervonic acid (C24:1) methyl esters and the determination of linolenic acid methyl ester in biodiesel. This analysis is possible on OPTIMA® BioDiesel F in only 25 min with baseline separation of lignoceric (C24:0) and nervonic acid (C24:1) methyl esters, also allowing quantification of linolenic acid methyl ester (see chromatogram below).

similar phases: Select™ Biodiesel for FAME, Trace TR-BioDiesel (F)
max. temperature for isothermal operation 250 °C, max. temperature for short isotherms in a temperature programme 260 °C

OPTIMA® BioDiesel G

for analysis of glycerol and glycerides in accordance with DIN EN 14105

The capillary column OPTIMA® BioDiesel G allows determination of free glycerol and residues of mono-, di- and triglycerides in FAMES intended as additives for mineral oils. The procedure can be applied for FAMES from rapeseed oil, sunflower oil and soy bean oil. Glycerol as well as mono- and diglycerides are derivatized to more volatile substances by addition of MSTFA (see page 260) in the presence of pyridine.

similar phases: Select™ Biodiesel for Glycerides, Trace TR-BioDiesel (G), MET-Biodiesel

max. temperature for isothermal operation 380 °C, max. temperature for short isotherms in a temperature programme 400 °C





Analysis of FAMES from biodiesel

Column: OPTIMA® BioDiesel F, 30 m x 0.25 mm ID,
max. temperature 250/260 °C,
REF 726900.30

Sample: standards in *n*-heptane

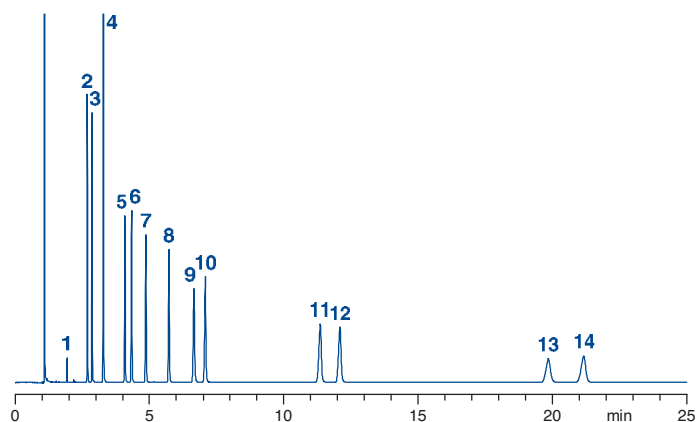
Injection: 2 µl, 250 °C

Carrier gas: 1.0 bar H₂, split 50 ml/min

Temperature: 210 °C

Detector: FID 250 °C

- Peaks:**
- | | |
|------------------|-----------|
| 1. C14 | 8. C18:3 |
| 2. C16 | 9. C20 |
| 3. C16:1 | 10. C20:1 |
| 4. C17, int. st. | 11. C22 |
| 5. C18 | 12. C22:1 |
| 6. C18:1 | 13. C24 |
| 7. C18:2 | 14. C24:1 |



MN Appl. No. 213330

Analysis of glycerol and glycerides from biodiesel

Column: OPTIMA® BioDiesel G,
10 m x 0.25 mm ID,
max. temperature 380/400 °C,
REF 726903.10

Sample: A) standard in *n*-heptane
B) biodiesel

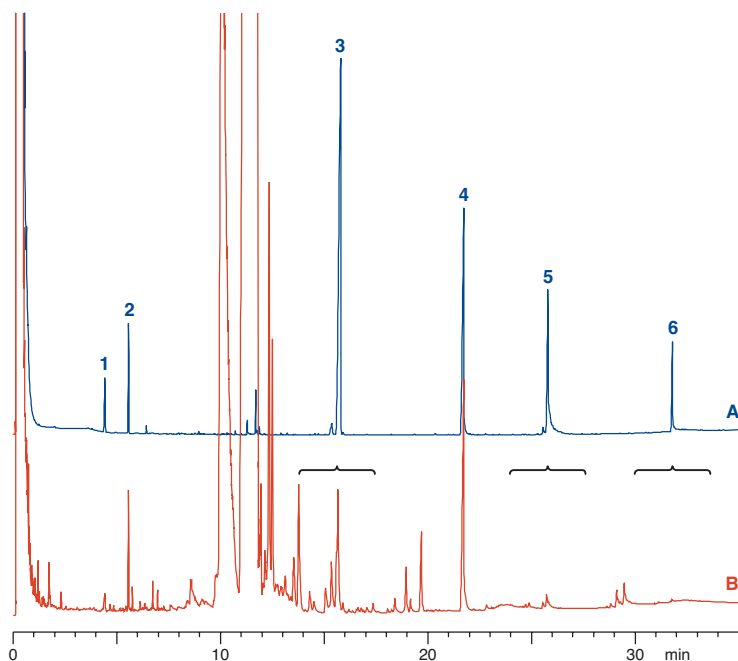
Injection: 2 µl, 350 °C,
CIS (15 °C → 350 °C, 12 °C/s)

Carrier gas: 0.8 bar H₂, split 1:2.6

Temperature: 50 °C (3.5 min) → 180 °C, 15 °C/min
→ 280 °C, 7 °C/min
→ 370 °C (10 min), 10 °C/min

Detector: FID 380 °C

- Peaks:**
- Glycerol (TMS)
 - Butanetriol (TMS), IS
 - Monoolein = glycerol monooleate (TMS)
+ monoacylglycerides
 - Tricaprin (glycerol tricaprinate), IS
 - Diolein = glycerol dioleate (TMS)
+ diacylglycerides
 - Triolein = glycerol trioleate
+ triacylglycerides



MN Appl. No. 213640

Ordering information

	Length →	10 m	30 m
OPTIMA® BioDiesel M			
0.32 mm ID (0.5 mm OD)			726905.30
OPTIMA® BioDiesel F			
0.25 mm ID (0.4 mm OD)			726900.30
OPTIMA® BioDiesel G			
0.25 mm ID (0.4 mm OD)		726903.10	