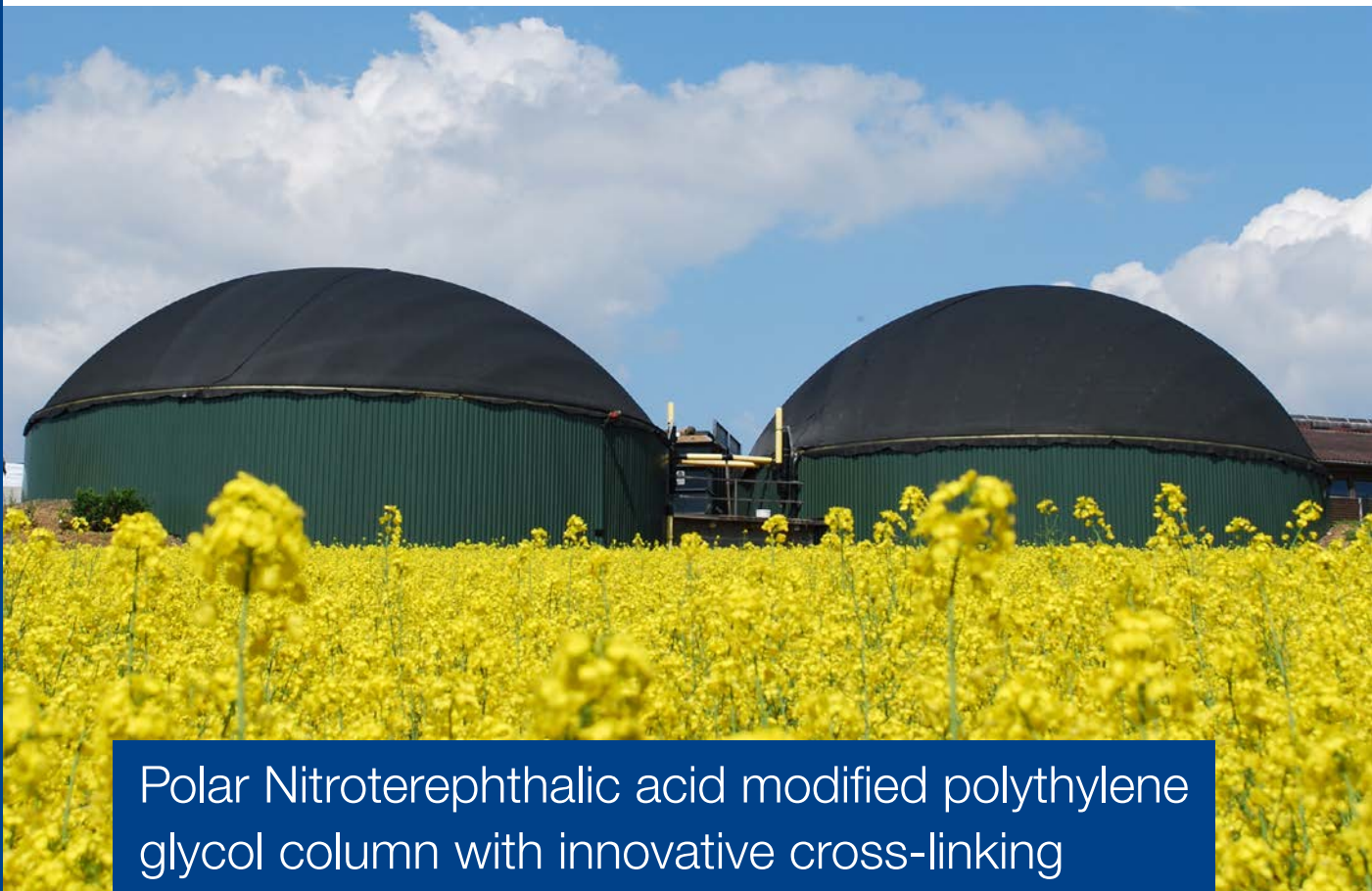


MACHEREY-NAGEL

# GC OPTIMA<sup>®</sup> FFAPplus

Chromatography



Polar Nitroterephthalic acid modified polyethylene glycol column with innovative cross-linking

- Improved temperature stability
- Excellent solvent stability and extended column lifetime
- Low column bleed, better suited for MS than conventional FFAP
- Allows for injection of aqueous samples
- OPTIMA<sup>®</sup> FFAPplus follows USP G35

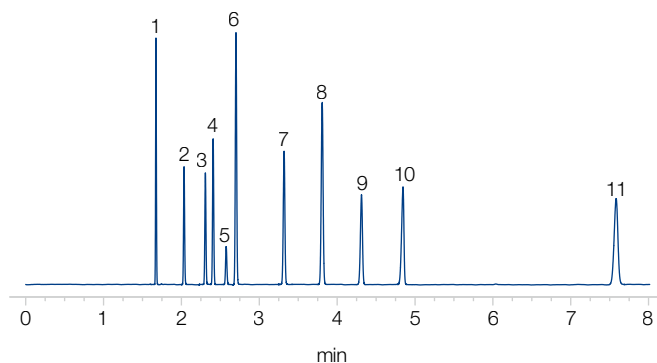
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## Solvents

OPTIMA® FFAPplus, 30 m, 0.25 mm, 0.25 µm  
 Carrier gas pressure: 1.1 bar He  
 Injection volume: 0.1 µL hot needle injection, Split: 1:200  
 Injection temperature: 230 °C  
 Detector temperature: FID 260 °C  
 Oven temperature: 60 °C (8 min), 15 °C/min, 150 °C (10 min)

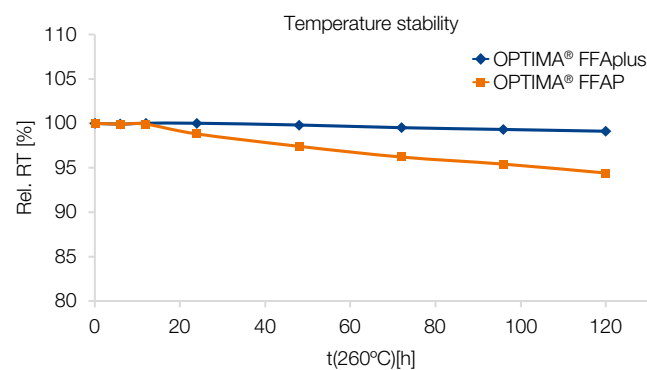


### Peaks:

1 *n*-hexane, 2 acetone, 3 ethyl acetate, 4 methyl ethyl ketone (MEK), 5 dichloromethane, 6 benzene, 7 methyl isobutyl ketone(MIBK), 8 toluene, 9 *n*-butyl acetate, 10 undecane, 11 *o*-xylene

The columns are conditioned at T=260 °C for a longer period of time. At various times, the relative retention of methyl undecanoate is determined with a temperature gradient (80 °C → 240 °C). The relative retention time on the FFAPplus decreases insignificantly, compared with the FFAP.

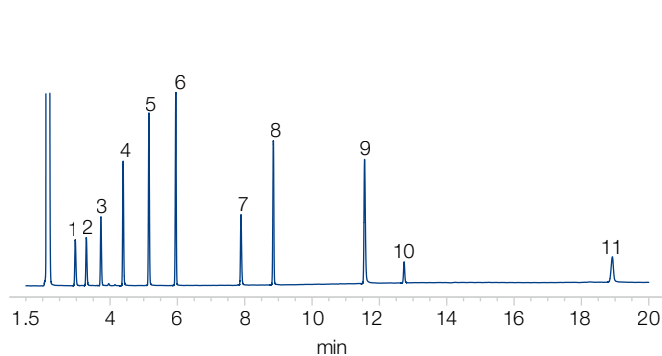
OPTIMA® FFAPplus, 30 m, 0.25 mm, 0.25 µm  
 Carrier gas pressure: 0.8 bar He  
 Injection volume: 1µL, Split 1:50  
 Injection temperature: 260 °C  
 Detector temperature: FID 260 °C



REF	Phase	ID	FD	Length
726241.30	OPTIMA® FFAPplus	0.25 mm	0.25 µm	30 m
726241.60	OPTIMA® FFAPplus	0.25 mm	0.25 µm	60 m
726242.30	OPTIMA® FFAPplus	0.25 mm	0.50 µm	30 m
726242.60	OPTIMA® FFAPplus	0.25 mm	0.50 µm	60 m
726243.30	OPTIMA® FFAPplus	0.32 mm	0.25 µm	30 m
726243.60	OPTIMA® FFAPplus	0.32 mm	0.25 µm	60 m
726246.30	OPTIMA® FFAPplus	0.32 mm	0.50 µm	30 m
726246.60	OPTIMA® FFAPplus	0.32 mm	0.50 µm	60 m

## Carboxylic acids

OPTIMA® FFAPplus, 30 m, 0.25 mm, 0.25 µm  
 Carrier gas pressure: 1.0 bar He  
 Injection volume: 1 µL Injection, Split: 1:50  
 Injection temperature: 230 °C  
 Detector temperature: FID 260 °C  
 Oven temperature: 150 °C, 10 °C/min, 260 °C (10 min)

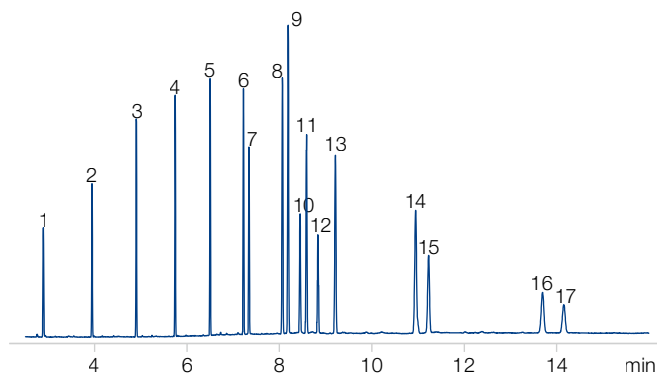


### Peaks:

1 acetic acid, 2 propionic acid, 3 butyric acid, 4 valeric acid, 5 caproic acid, 6 2-ethylcaproic acid, 7 sorbic acid, 8 capric acid, 9 hydratropic acid, 10 myristic acid, 11 stearic acid

## Fames from biodiesel acc. DIN EN 14103:2011

OPTIMA® FFAPplus, 30 m, 0.25 mm, 0.25 µm  
 Flow rate: 40 cm/s He  
 Inj. vol.: 1 µL, Split: 1:15  
 Inj. temp.: 260 °C  
 Detector: MS-EI  
 Ion source temp.: 200 °C  
 Interface temp. 250 °C  
 Oven temp.: 70 °C (1 min), 30 °C/min, 240 °C(10 min)



### Peaks:

#### Methyl ester from:

1 caproic acid (C6:0), 2 caprylic acid (C8:0), 3 capric acid (C10:0), 4 lauric acid (C12:0), 5 myristic acid (C14:0), 6 palmitic acid (C16:0), 7 palmitoleic acid (C16:1), 8 stearic acid (C18:0), 9 oleic acid (C18:1 cis), 10 linoleic acid (C18:2 cis), 11 nonadecanoic acid (C19:0), 12 linolenic acid (C18:3), 13 arachidic acid (C20:0), 14 behenic acid (C22:0), 15 erucic acid (C22:1 cis), 16 lignoceric acid (C24:0), 17 nervonic acid (C24:1 cis)

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# MACHEREY-NAGEL



Management System  
 EN ISO 13485:2016  
 ISO 9001:2015  
 www.tuv.com  
 ID 0000056401



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