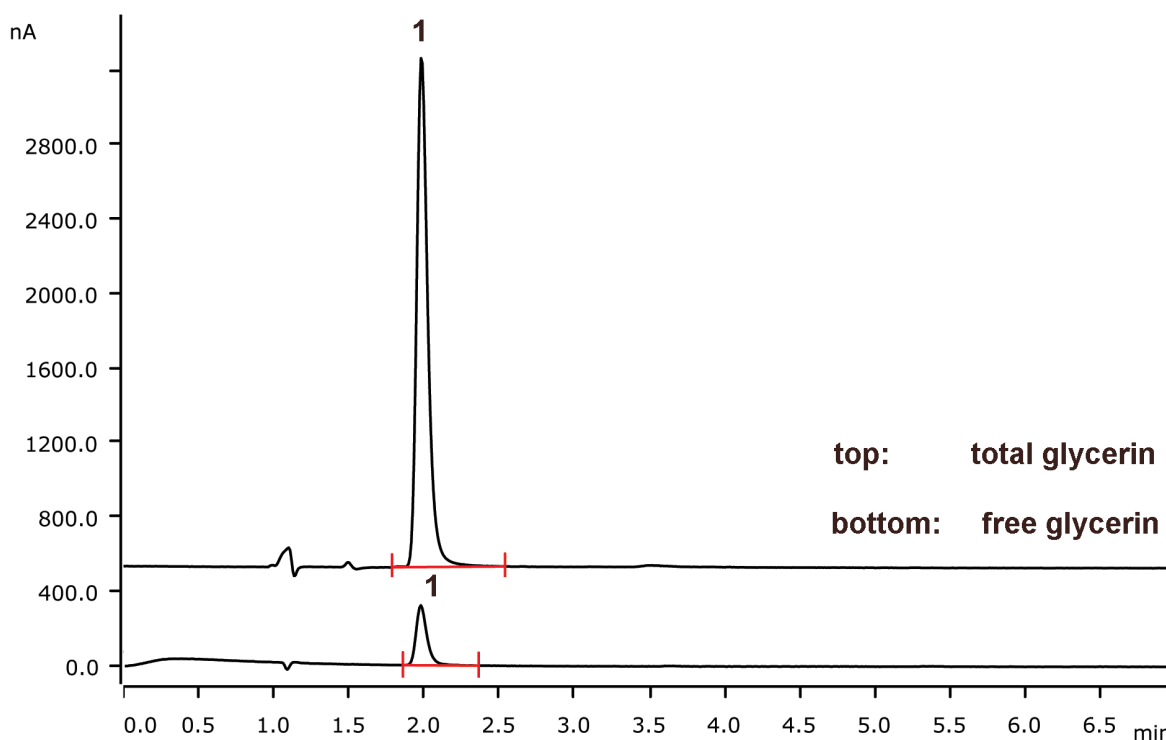


# Free and total glycerin in biodiesel and biodiesel blends according to ASTM D7591



The production of biodiesel or green diesel from oils and fats leads to the formation of free and bound glycerin (also glycerol) as by-products after transesterification of the triglycerides. These glycerins speed up fuel aging and lead to deposits in the engine and blocked filters. To ensure engines operate properly, the American ASTM D6751 and the European EN 14214 limit the maximum total glycerin content. This note shows the determination of free and total glycerin in a biodiesel blend on a Metrosep Carb 2 - 150/4.0 column following ASTM D 7591.

## Results

Compound	Concentration [mg/kg]	Mass [%]	RSD [%; n = 10]
Free glycerin	6.52	0.001	0.68
Total glycerin	98.15	0.010	1.17

## Sample

Biodiesel blend E8

## Sample preparation

Free glycerin is extracted from the blend with ultrapure water. For total glycerin the aqueous phase after saponification is injected.

## Columns

Metrosep Carb 2 - 150/4.0	6.1090.420
Metrosep Carb 2 Guard/4.0	6.1090.500

## Solutions

Eluent	100 mmol/L sodium hydroxide
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## Parameters

Flow rate	1.0 mL/min
Injection volume	10 µL
P <sub>max</sub>	20 MPa
Recording time	7 min
Column temperature	30 °C

## PAD Parameters

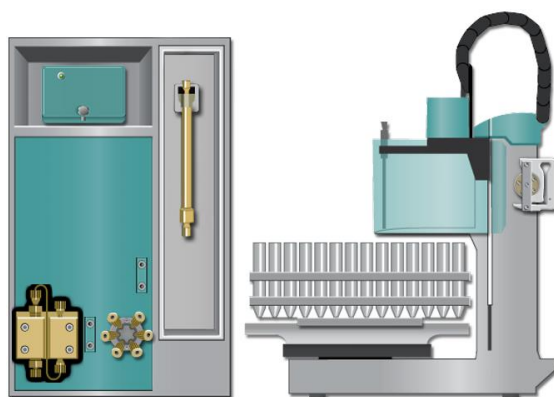
Cell	Wall-Jet cell
Working electrode	Gold
Reference electrode	Palladium
Spacer	50 µm
Measuring potential	0.05 V
Measuring duration	100 ms
Cycle duration	550 ms
Measuring range	200 µA
Temperature	35 °C
Mode	PAD

## Analysis

Pulsed amperometric detection

## Instrumentation

930 Compact IC Flex Oven/Deg	2.930.2160
IC Amperometric Detector	2.850.9110
858 Professional Sample Processor	2.858.0020
IC equipment Wall-Jet cell: Carb (Au, Pd)	6.5337.010



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