



### C5.4.1 FUELS

C5.4.1.1  
Production of fuel from rapeseed oil

C5.4.1.2  
Analysis of fuel from rapeseed oil

Production of fuel from rapeseed oil (C5.4.1.1)

Cat. No.	Description	C5.4.1.1	C5.4.1.2
666 8471	Magnetic stirrer with hotplate	1	
666 851	Stirring magnet 25 mm x 6 mm Ø, circular	1	
666 850	Stirring magnet, 15 mm x 5 mm diam.	1	
602 004	Test tubes, DURAN, 20 x 180 mm, set of 100	1	
667 053	Test tube rack, for 10 tubes, 22 mm diam.	1	
664 103	Beaker, DURAN, 250 ml, squat	1	
602 022	Beaker Boro 3.3, 100 ml, squat	1	
300 02	Stand base, V-shaped, small	1	
301 27	Stand rod 50 cm, 10 mm Ø	1	
301 09	Bosshard S	2	1
666 555	Universal clamp 0...80 mm	2	1
382 21	Stirring thermometer -10...+110 °C	1	
665 953	Dropping pipette, 7 x 150 mm, 10 pcs.	1	
665 954	Rubber bulbs, 10 pcs	1	
665 995	Graduated pipette 2 ml	1	
665 996	Graduated pipette, 5 ml	1	
666 003	Pipetting ball (Peleus ball)	1	3
667 257	Rubber stopper solid, 19...24 mm Ø	1	
667 258	Rubber stopper, one 7-mm hole, 19...24 mm Ø	1	
665 204	Glass tube, 300 mm x 8 mm diam.	1	
673 2700	Methanol, 250 ml	1	
673 6800	Sodium hydroxide, pellets, 100 g	1	
524 005W	Mobile-CASSY 2 WiFi		1
524 044	Temperature sensor S, NTC		1
607 5025	Magnetic stirrer with hotplate		1

Cat. No.	Description	C5.4.1.1	C5.4.1.2
300 41	Stand rod, 25 cm, 12 mm Ø		1
608 310	Evaporating dish 24 ml, 60 mm dia.		3
672 2520	Wooden turnings		1
665 994	Graduated pipette 1 ml		1
LDS 00001	Stopwatch, digital		1
672 1740	Heating oil, 250 ml		1
	additionally required: rapeseed oil, cardboard	1	
	additionally required: biodiesel from rapeseed oil produced in experiment C5.4.1.1 rapeseed oil lighter		1

Rising energy demand ushered in by the industrial age in combination with the continuously increasing world population have caused worldwide consumption of fossil fuels such as oil, natural gas and coal to increase by more than twenty-fold over the past 100 years. The resulting shortage of fossil fuels demands, along with more frugal use of energy, the search for equivalent renewable sources of energy, including the suitable eco-friendly fuels.

In experiment C5.4.1.1, sodium methoxide is used to produce biodiesel from rapeseed oil. In this reaction, the rapeseed oil is first split into glycerine and fatty acids, and then esterified with methanol (transesterification) in a second step. The rapeseed acid-methylesters produced in this way represent the actual biodiesel. In experiment C5.4.1.2 rapeseed oil is analysed. For this purpose, the viscosity and inflammability of rapeseed oil, diesel fuel, and rapeseed oil are compared.