Supplementary material to

Stability evaluation of biodiesel supplemented with synthetic and bio-based antioxidants by a pressurized accelerated oxidation method

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Table D1. Fatty acid composition[a], molar mass and iodine value of sunflower oil used as a feedstock for biodiesel synthesis in this study

Acid		Formula	Content, mas.%
C16:0	Palmitic	$C_{16}H_{32}O_2$	5.87
C18:0	Stearic	$C_{18}H_{36}O_2$	0.22
C18:1	Oleic	$C_{18}H_{34}O_2$	35.07
C18:2n6c	Linoleic	$C_{18}H_{32}O_2$	52.04
C18:3n3	Linolenic	$C_{18}H_{30}O_2$	0.97
C20:0	Arachidic	$C_{20}H_{40}O_2$	1.55
Molar mass, g mol^{-1}			878.14
Iodine value, g I_2 (100 g)$^{-1}$			122.8

[a]Determined by gas chromatograph (GC-2010 plus, Shimadzu) equipped with flame ionization detector, autosampler AOC-20I and capillary column InterCap (30 m length, 0.25 mm inner diameter, 0.25 µm film thickness). The temperature of injector and detector was 260 °C, and the analysis was conducted under isothermal conditions at 200 °C. Helium was the carrier gas with 3 mL·min^{-1} flow. Methyl heptadecanoate (purity> 99%) (Fluka Analitical) was used as internal standard.

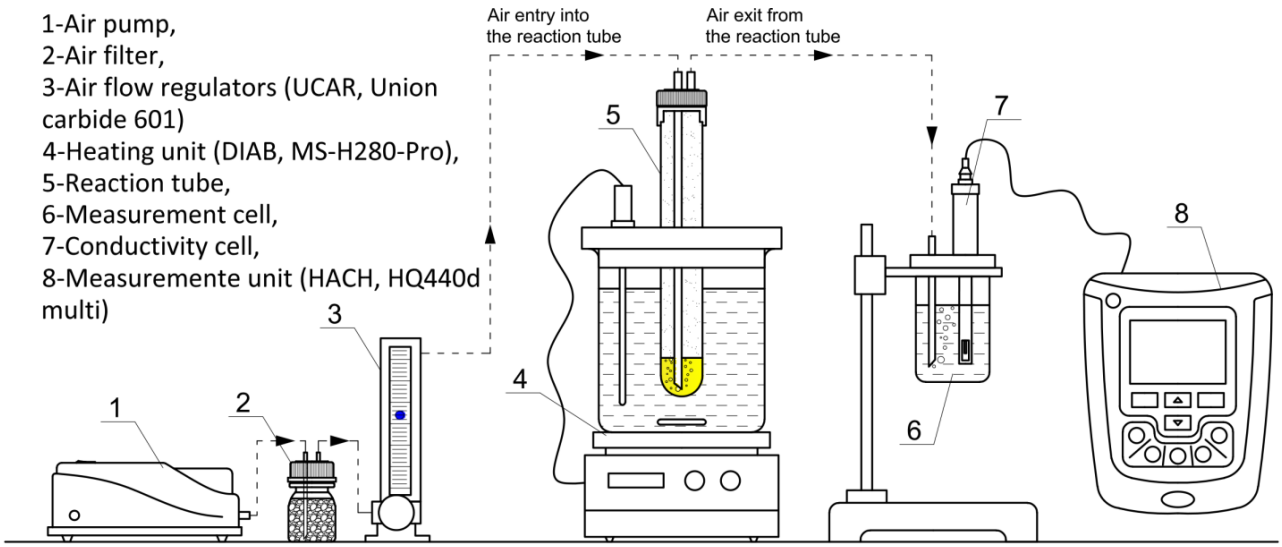

Figure D1. Equipment for determination of oxidation stability in accordance to the Rancimat method (EN14112)

Figure D2. RapidOxy oxidation stability tester (RapidOxy 100, Anton Paar) at the University of Novi Sad, Faculty of Technology Novi Sad, Serbia

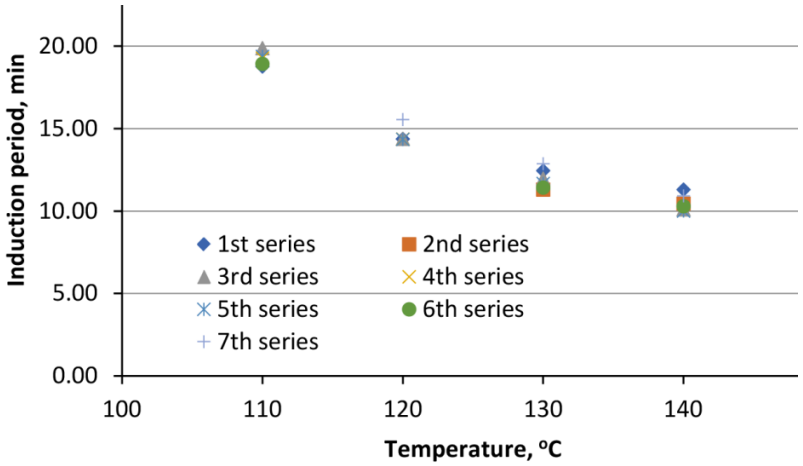

Figure D3. Individual values of biodiesel induction periods determined at different temperatures by RapidOxy tester (one series represent data obtained in one day)

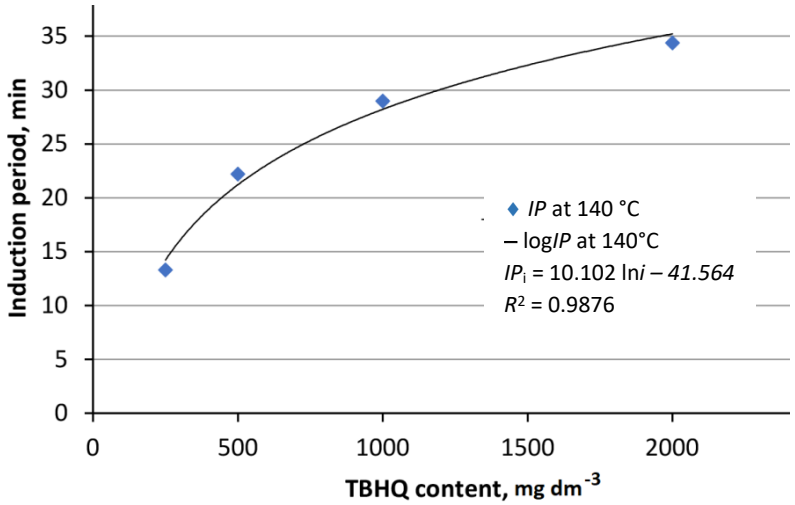

Figure D4. Dependence of induction periods, IP / min, of biodiesel at 140 °C for varying additions of TBHQ determined by RapidOxy tester (rhombuses are experimentally determined IP values; line represent logarithmic model that described this dependence with the given equation and coefficient of determination, R^2)

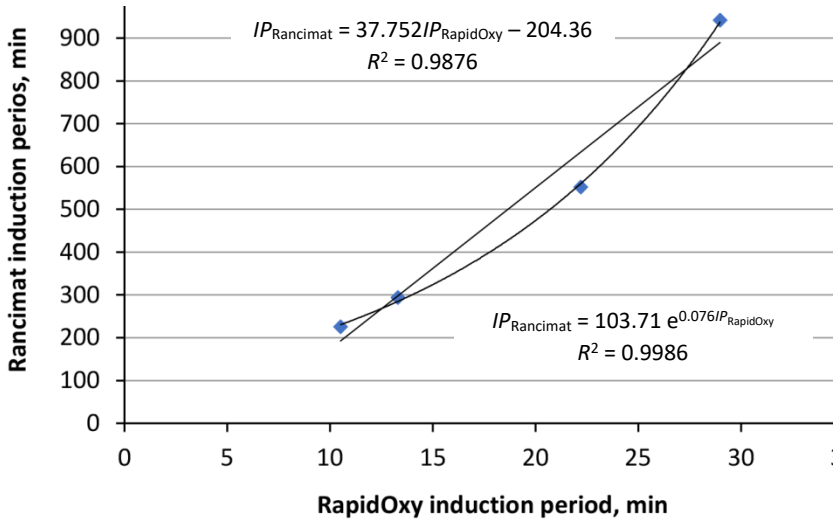

Figure D5. Comparison of the respective results obtained in this study by Rancimat (at 110 °C) and RapidOxy (at 140 °C) methods