

Article

# Highly hydrophobic properties in olive oil-coated papers through thermal treatment

Amelia Loesch-Zhang<sup>1</sup>, Tobias Meckel<sup>1</sup>, Markus Biesalski<sup>1</sup> and Andreas Geissler<sup>1,2\*</sup>

## Supporting information

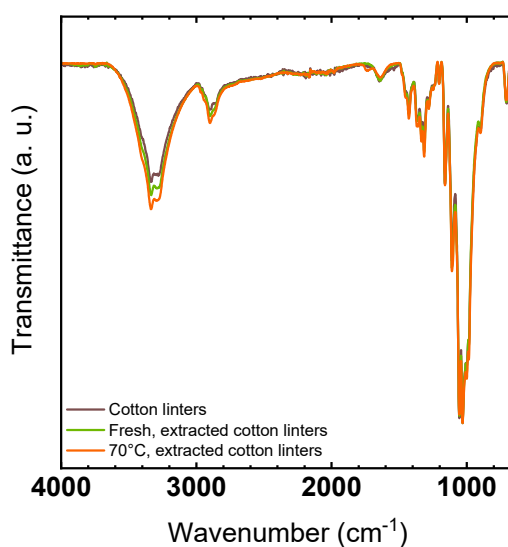
### Protocol for gas chromatography–mass spectrometry/flame ionization detector (GC-MS/FID)

GC-MS/FID measurements were performed on an Agilent HP 6890 gas chromatograph (Agilent Technologies Deutschland GmbH, Waldbronn, Germany) equipped with parallel mass detection and flame ion detection. Separation was carried out on a VF5MS-60M column (Agilent Technologies Deutschland GmbH, Waldbronn, Germany) (inner diameter 0.25 mm, film thickness 0.25  $\mu\text{m}$ ). The injection was performed using an HP PTV injector at 573.15 K, split ratio 15:1 and 1  $\mu\text{L}$  injection volume. Helium was used as carrier gas (2 mL/min flow rate).

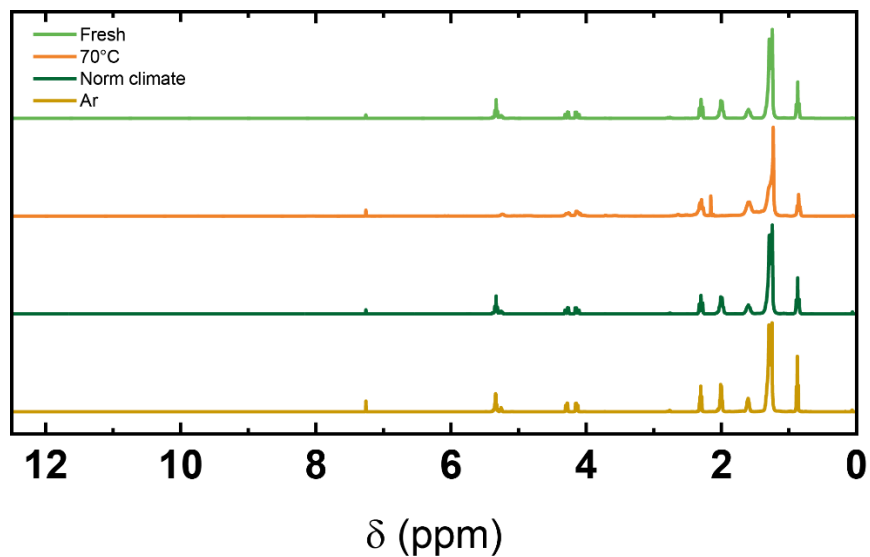
Online methylation of olive oil was required to transfer fatty acids into the gas phase. For this, oils were added to dichloromethane (5.59 mg oil per mL dichloromethane) together with a solution of fluoranthene in dichloromethane (2 g/mL, 100  $\mu\text{L}$ ) as an internal standard and trimethylsulfonium hydroxide (400  $\mu\text{L}$ ) trimethylsulfonium hydroxide.

The following temperature program was used: holding at 318.15 K (4 min), heating to 478.15 K (3 K/min), holding at 478.15 K (13 min), heating to 598.15 K (3 K/min), holding at 598.15 K (20 min).

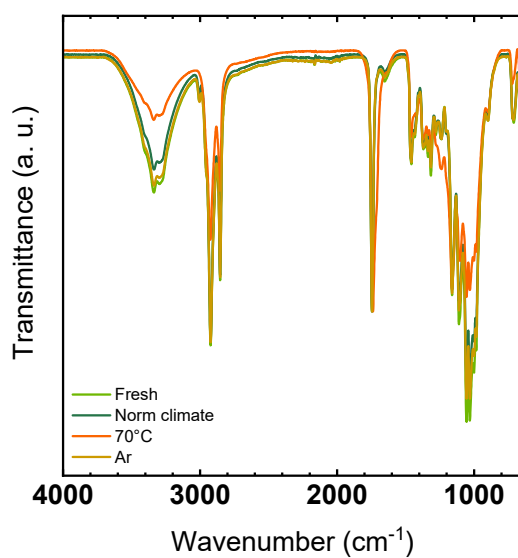
For the evaluation, FID signals were calibrated against methylated standards. Mass fractional content of methylated fatty acids was calculated relative to unmethylated fatty acids based on their respective molecular weights.



**Figure S1.** Full ATR-FTIR spectrum of extracted cotton linters after varying aging processes showing a small C=O band indicating esterification exclusively after thermal aging.



**Figure S2.** Full NMR spectra of olive oil extracted from cotton linters (fresh and after aging).



**Figure S3.** ATR-FTIR spectra normalized to C=O peak intensity of freshly olive oil-coated cotton linter paper and aged under different conditions.