

## SUPPORTING INFORMATION

# Alizarin-based Soybean oil Materials for the Synthesis of 3D-photoprinted Objects with efficient Antibacterial Properties

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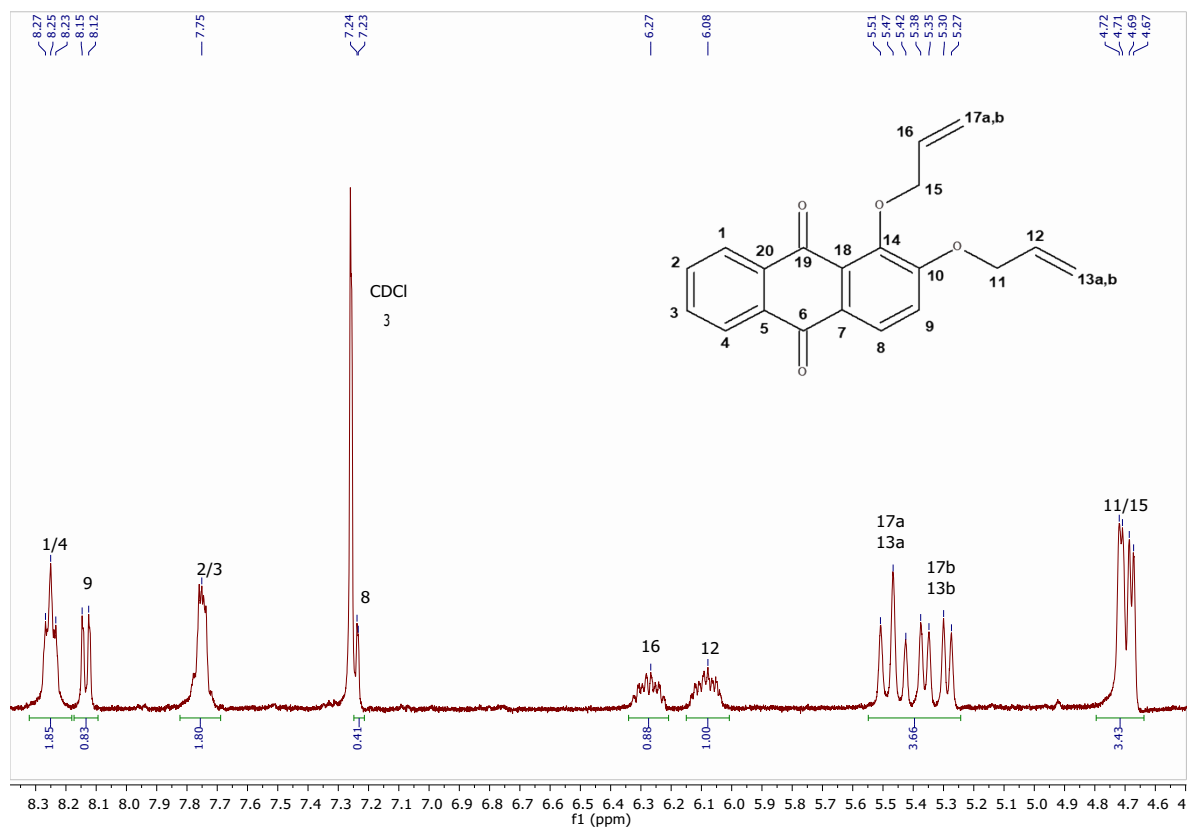
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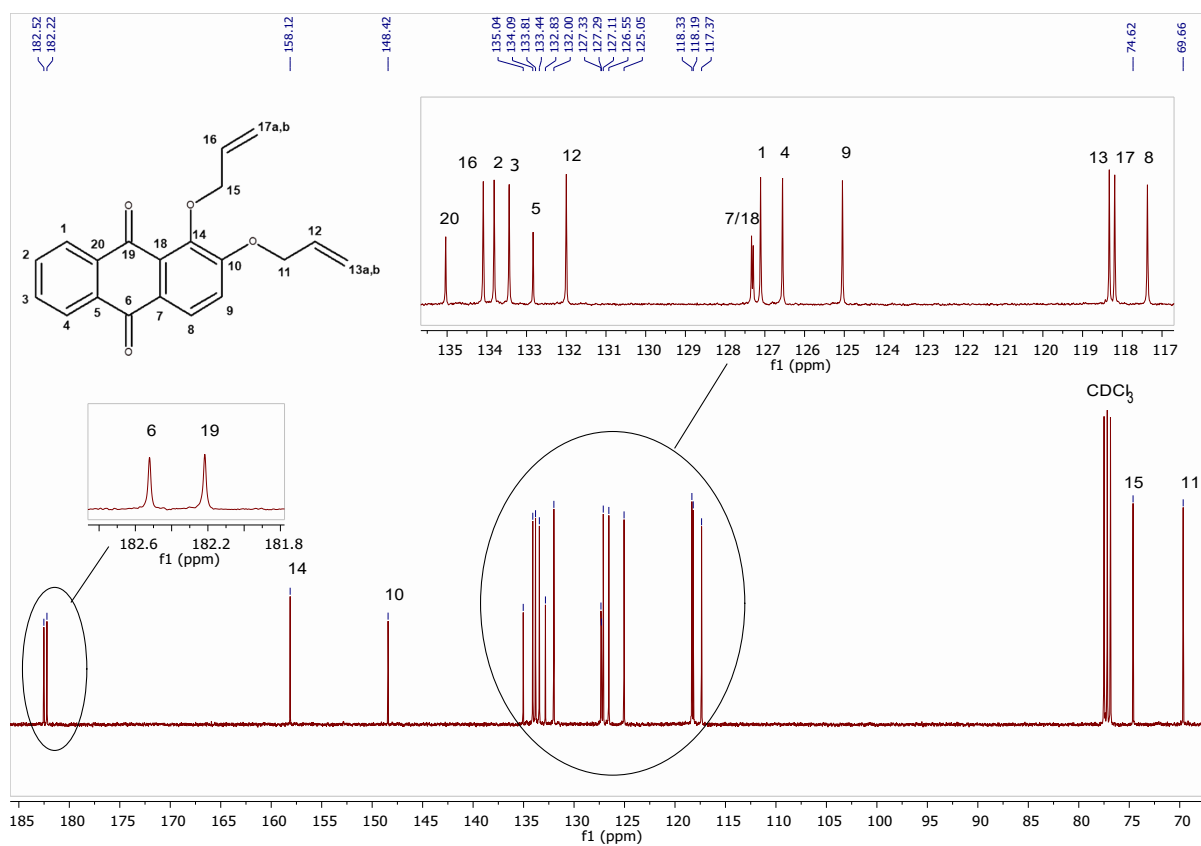
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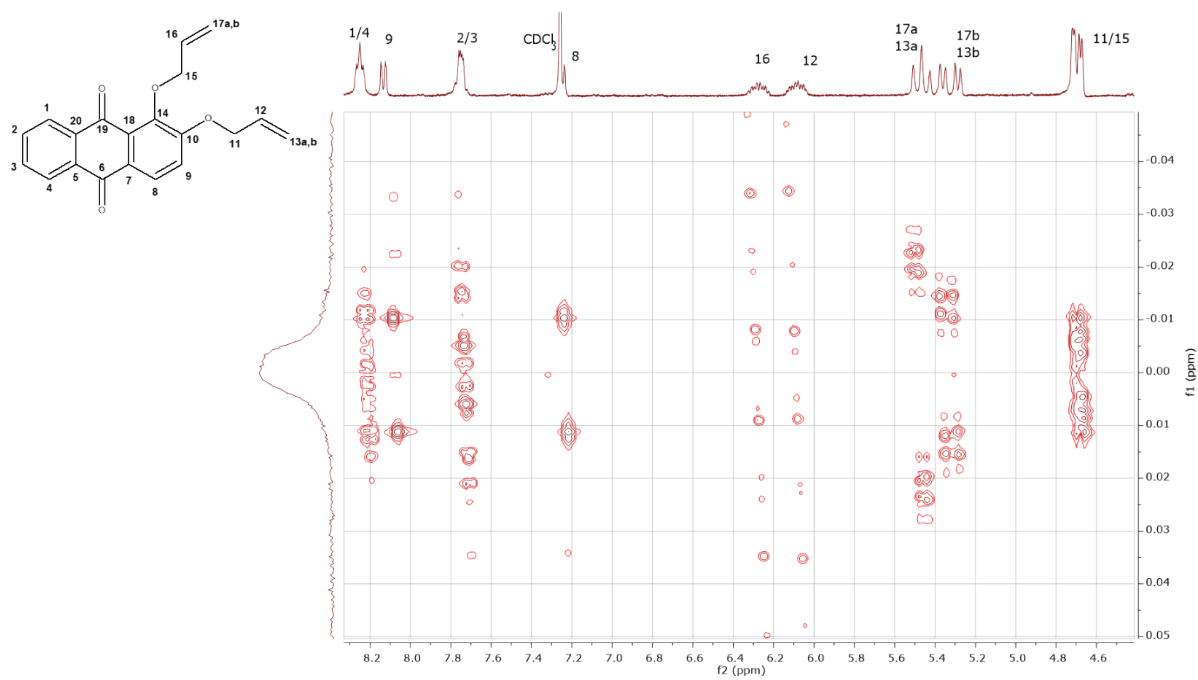
# FIGURES



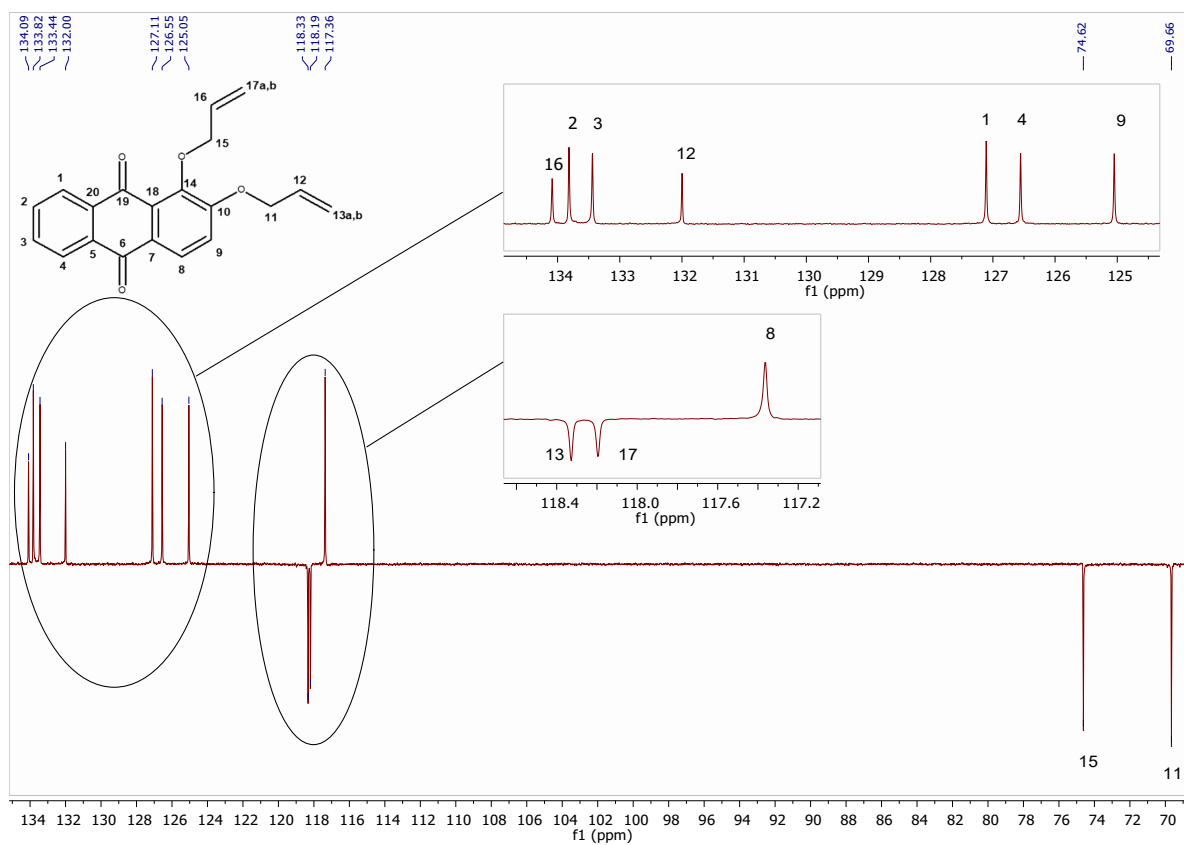
**Figure S1.**  $^1\text{H}$  NMR spectrum of AA in  $\text{CDCl}_3$ .



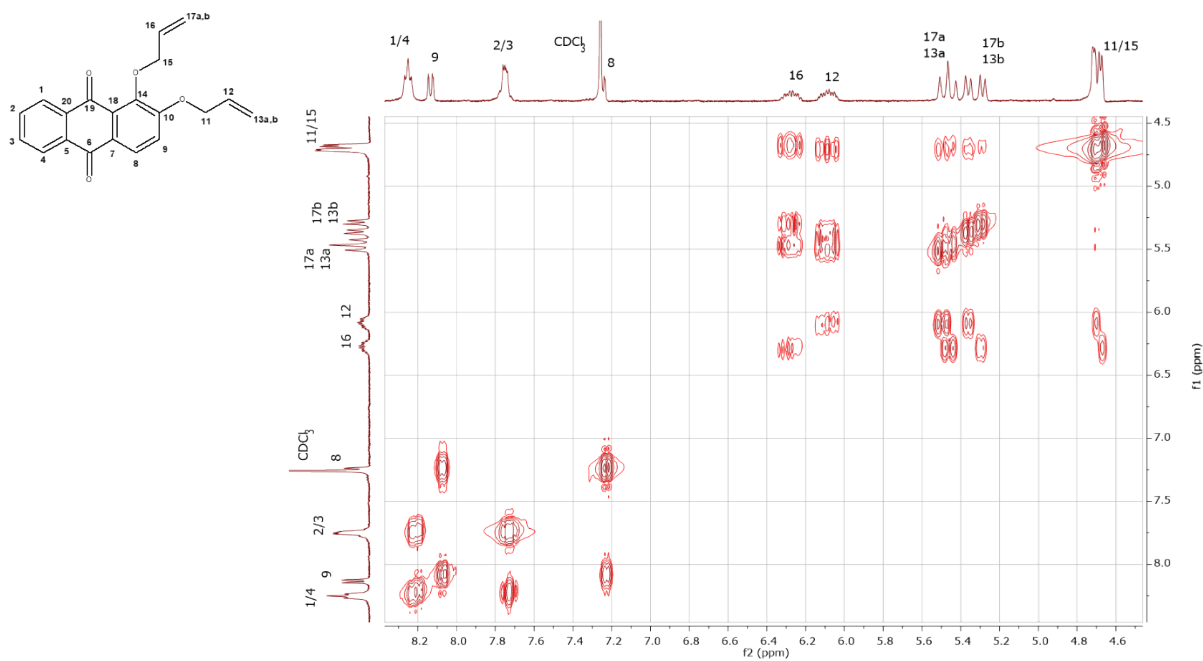
**Figure S2.**  $^{13}\text{C}$  NMR spectrum of AA in  $\text{CDCl}_3$ .



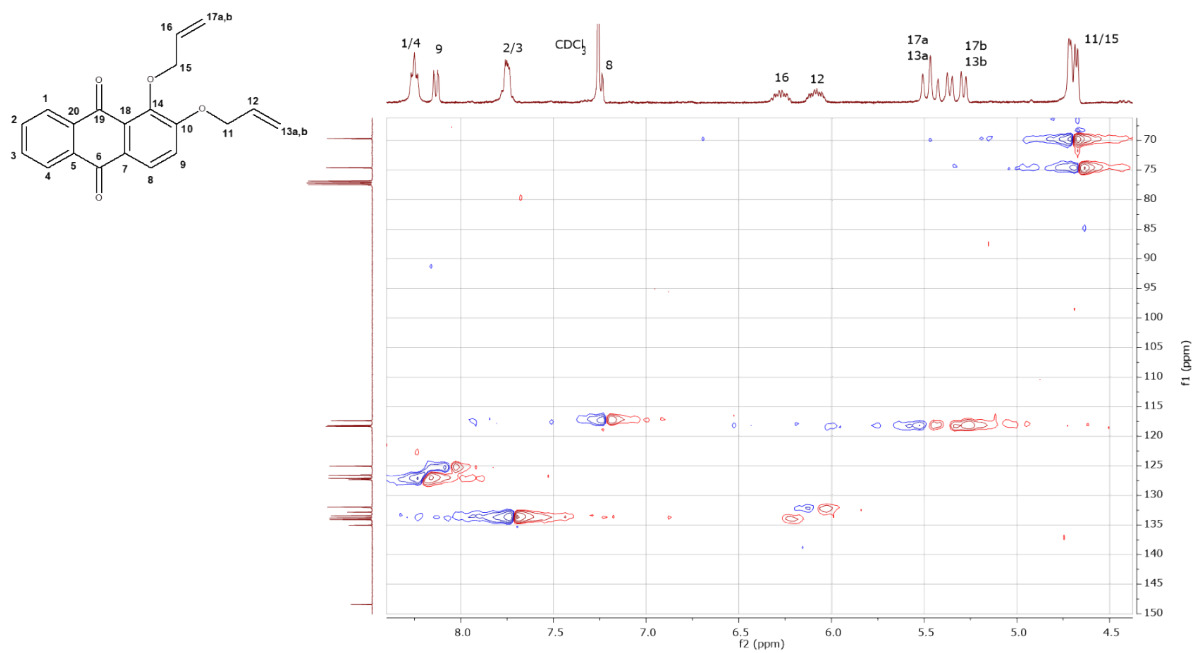
**Figure S3.** J-res NMR spectrum of AA in  $\text{CDCl}_3$ .



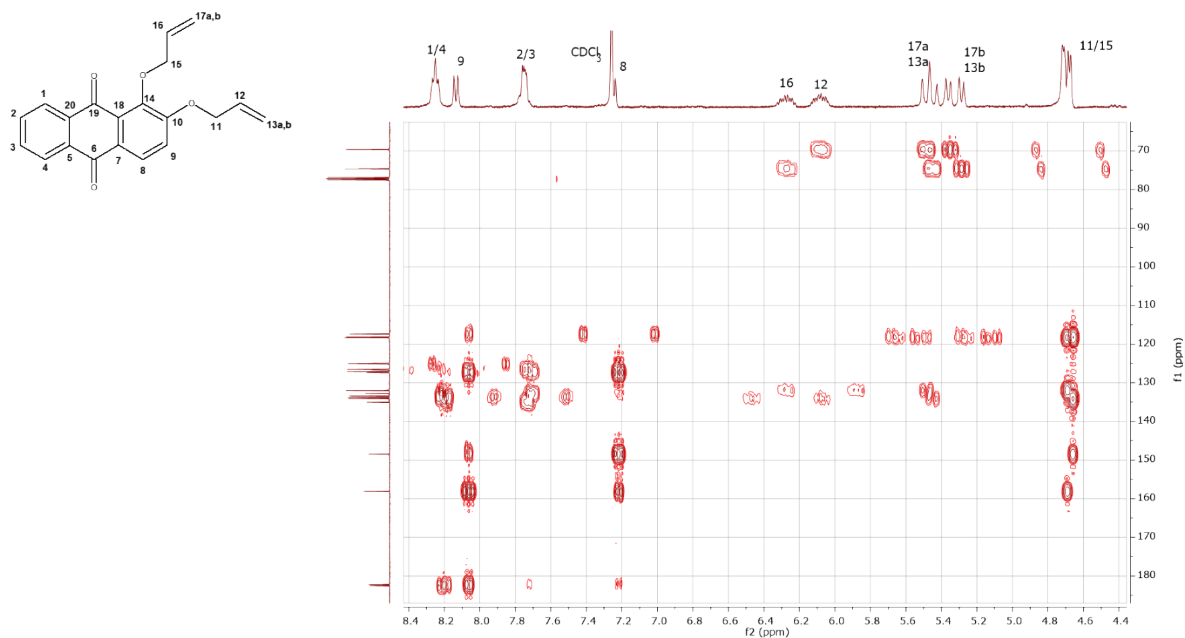
**Figure S4.** DEPT 135 NMR spectrum of AA in CDCl<sub>3</sub>.



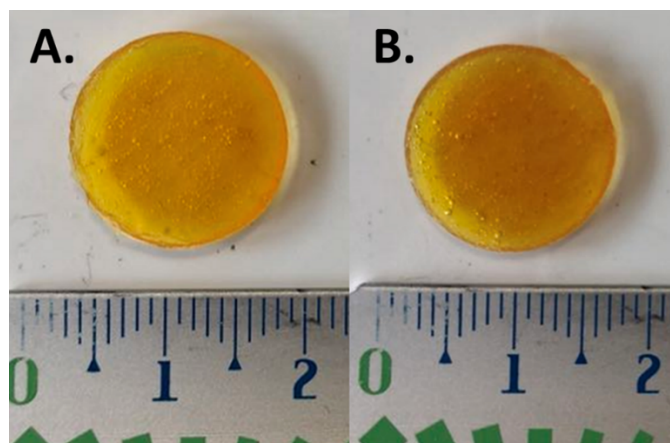
**Figure S5.** COSY NMR spectrum of AA in CDCl<sub>3</sub>.



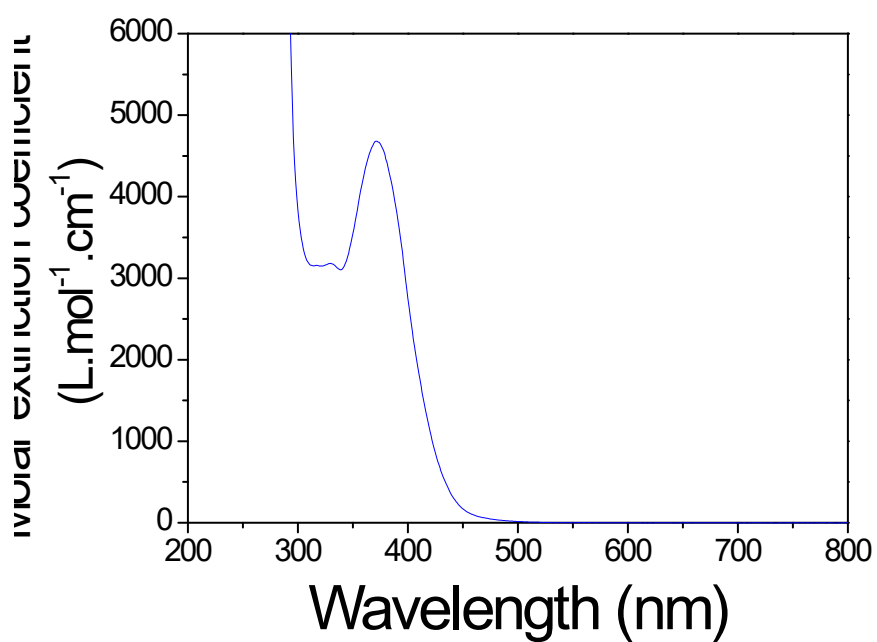
**Figure S6.** HSQC NMR spectrum of AA in  $\text{CDCl}_3$ .



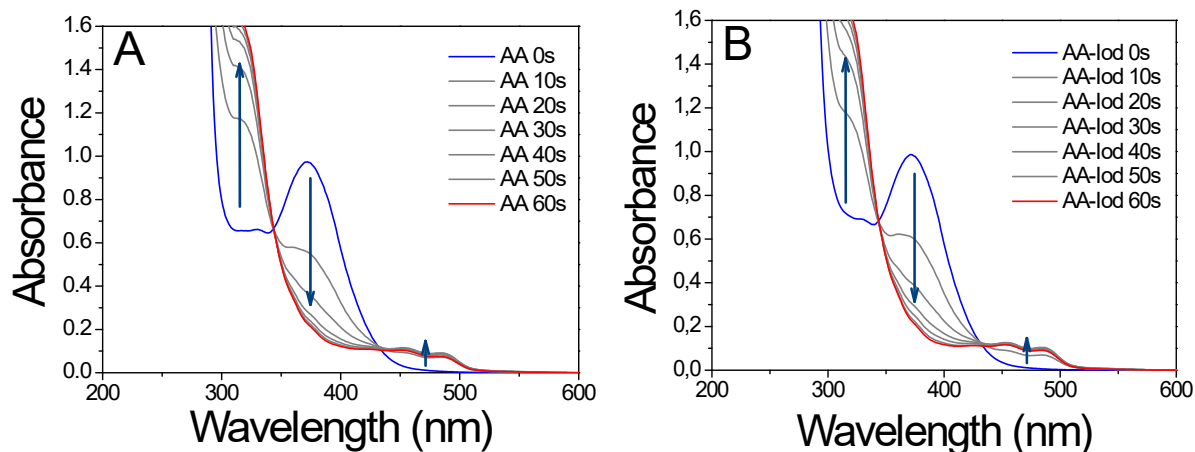
**Figure S7.** HMBC NMR spectrum of AA in  $\text{CDCl}_3$ .



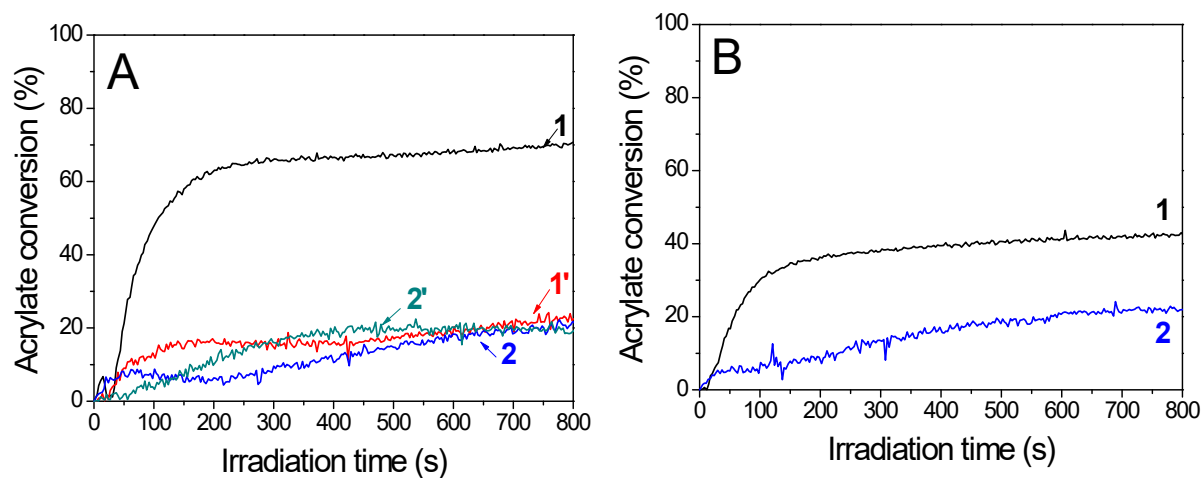
**Figure S8.** Optical images of the **A)** AA/Iod/geraniol/SOA and **B)** AA/Iod/SOA pellets obtained under LED@405 nm irradiation.



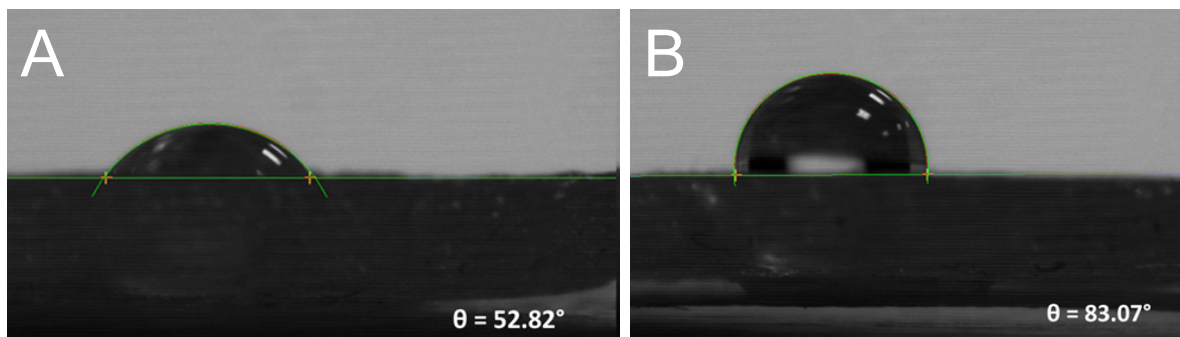
**Figure S9.** Molar extinction coefficient of AA in ACN.



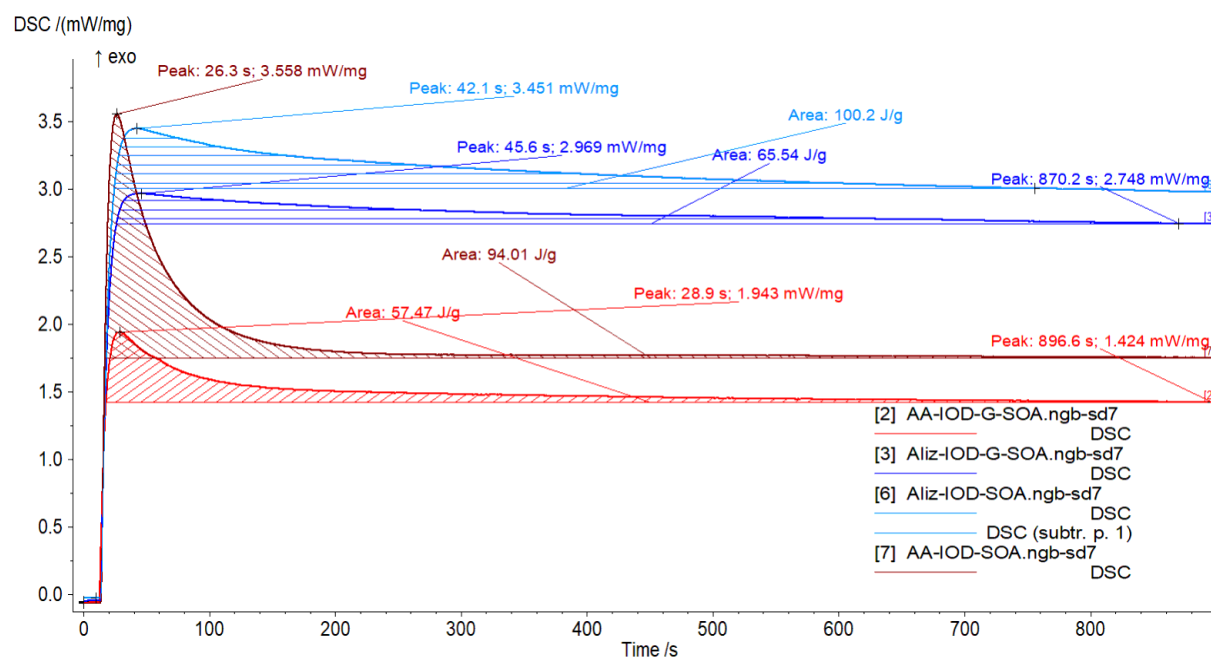
**Figure S10.** Steady-state photolysis of **A)** AA and **B)** AA/Iod in ACN after 60 s upon LED@405 nm irradiation ( $[AA] = 2.08 \times 10^{-4} \text{ M}$ ,  $[Iod] = 5.3 \times 10^{-4} \text{ M}$ ).



**Figure S11.** Kinetic profiles of SOA in **A)** Aliz/Iod/SOA and **B)** Aliz/Iod/geraniol/SOA formulations upon **1)** LED@405 nm in laminate, **1')** LED@405 nm under air, **2)** LED@455 nm in laminate and **2')** LED@455 nm under air.

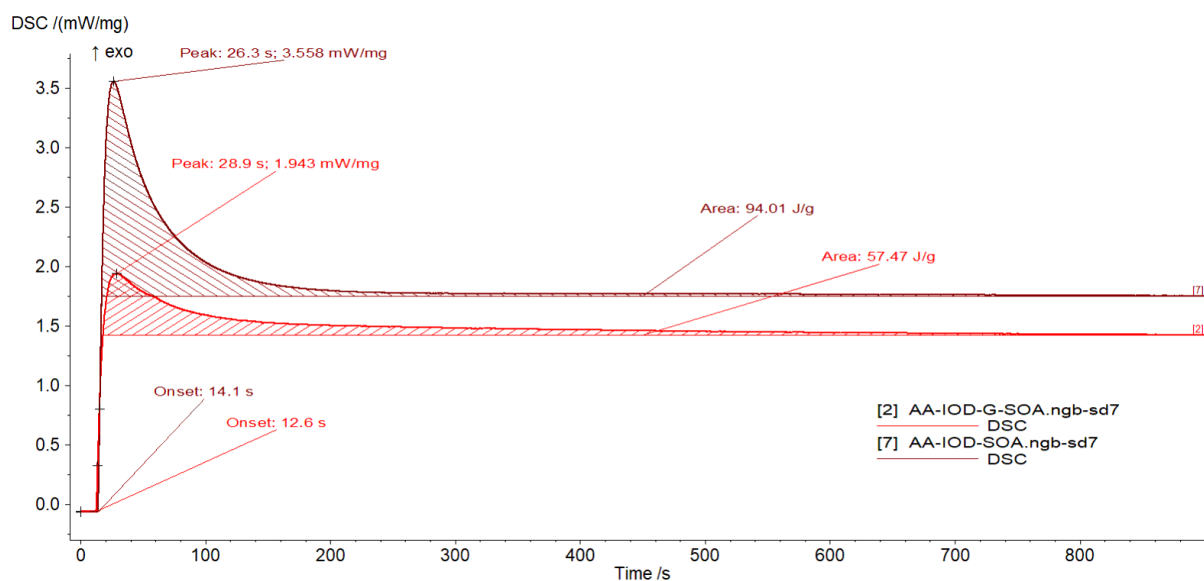


**Figure S12.** Water contact angle of the surface of A) AA/Iod/geraniol/SOA and B) AA/Iod/SOA materials.

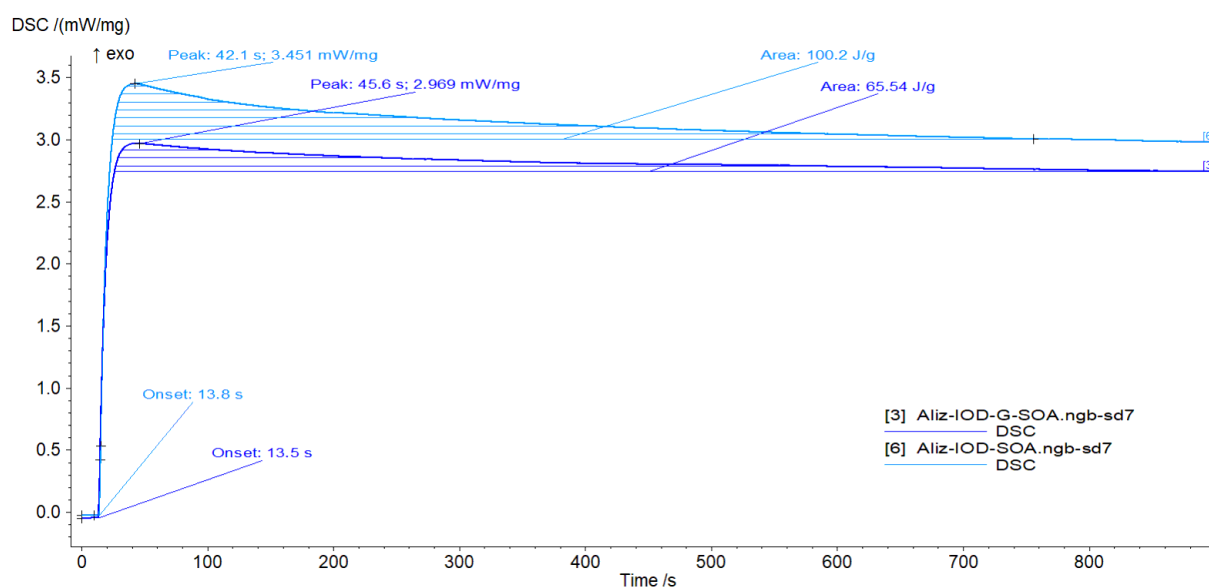


**Figure S13.** Summary of the photo-DSC curves obtained directly from measurements for the following compositions i.e. AA/Iod/SOA, AA/Iod/geraniol/SOA, Aliz/Iod/SOA, and Aliz/Iod/geraniol/SOA formulations using LED@405 nm irradiation.

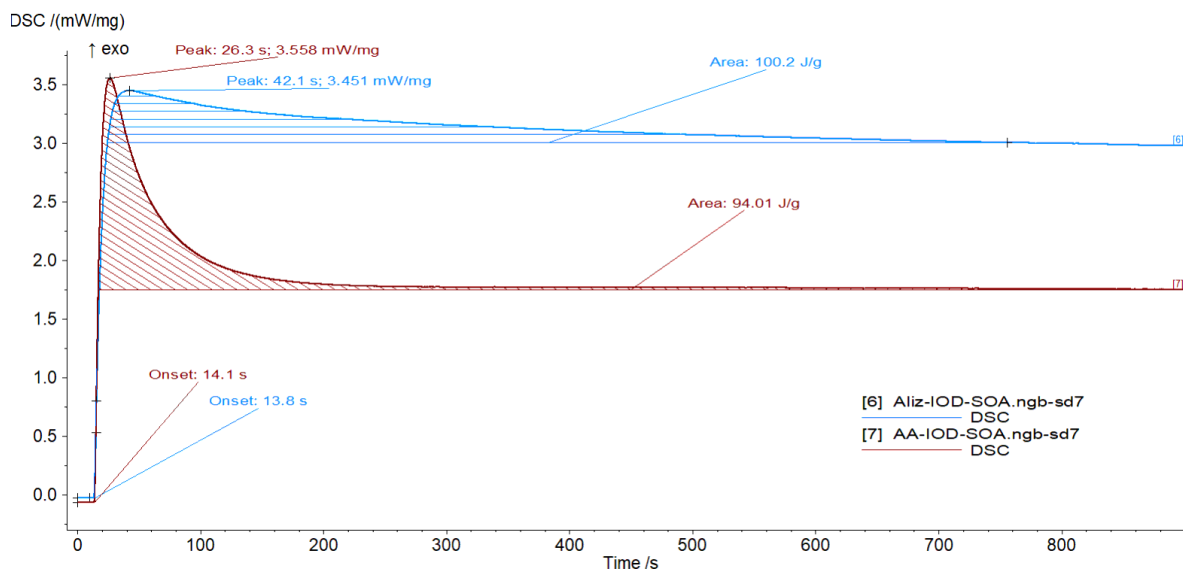




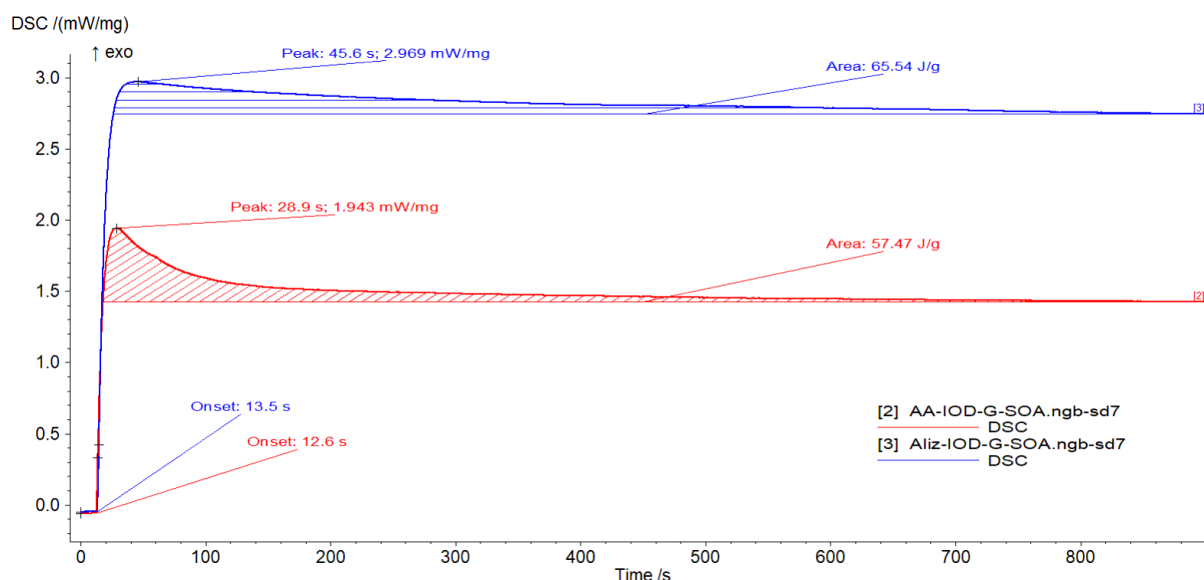
**Figure S14.** The comparison of the photo-DSC curves obtained directly from measurements for the following compositions i.e. AA/Iod/SOA, AA/Iod/geraniol/SOA formulations using LED@405 nm irradiation – analysis of the effect of geraniol addition on the kinetics of radical photopolymerization.



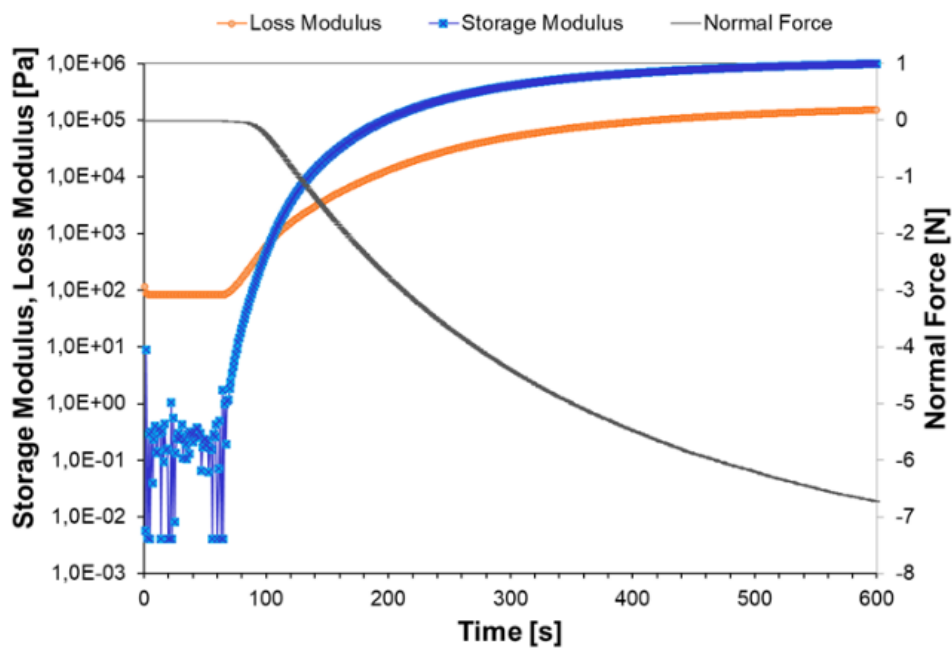
**Figure S15.** The comparison of the photo-DSC curves obtained directly from measurements for the following compositions i.e. Aliz/Iod/SOA, and Aliz/Iod/geraniol/SOA formulations using LED@405 nm irradiation – analysis of the effect of geraniol addition on the kinetics of radical photopolymerization.



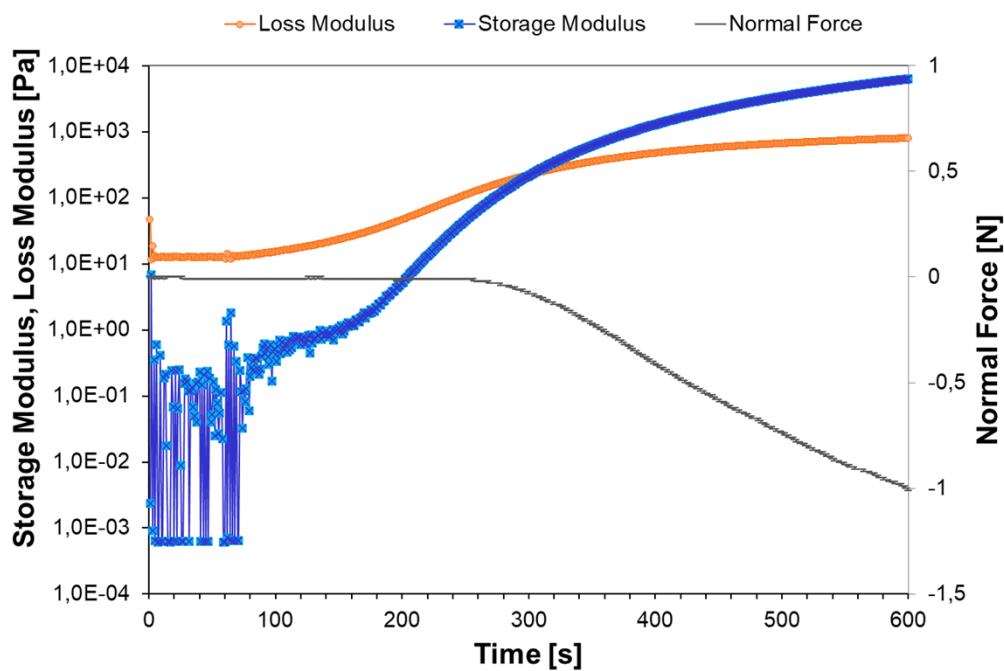
**Figure S16.** The comparison of the photo-DSC curves obtained directly from measurements for the following compositions i.e. AA/Iod/SOA and Aliz/Iod/SOA formulations using LED@405 nm irradiation - analysis of the effect of photosensitiser type using a diallylic alizarin derivative, with alizarin as the reference compound.



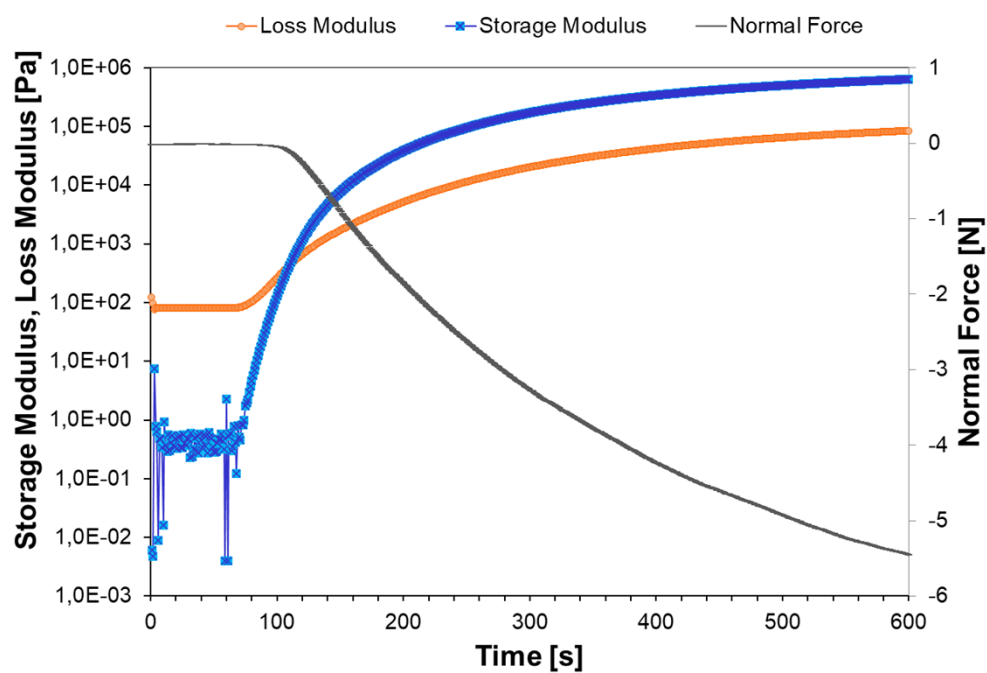
**Figure S17.** The comparison of the photo-DSC curves obtained directly from measurements for the following compositions i.e. AA/Iod/geraniol/SOA and Aliz/Iod/geraniol/SOA formulations using LED@405 nm irradiation - analysis of the effect of photosensitiser type using a diallylic alizarin derivative, with alizarin as the reference compound.



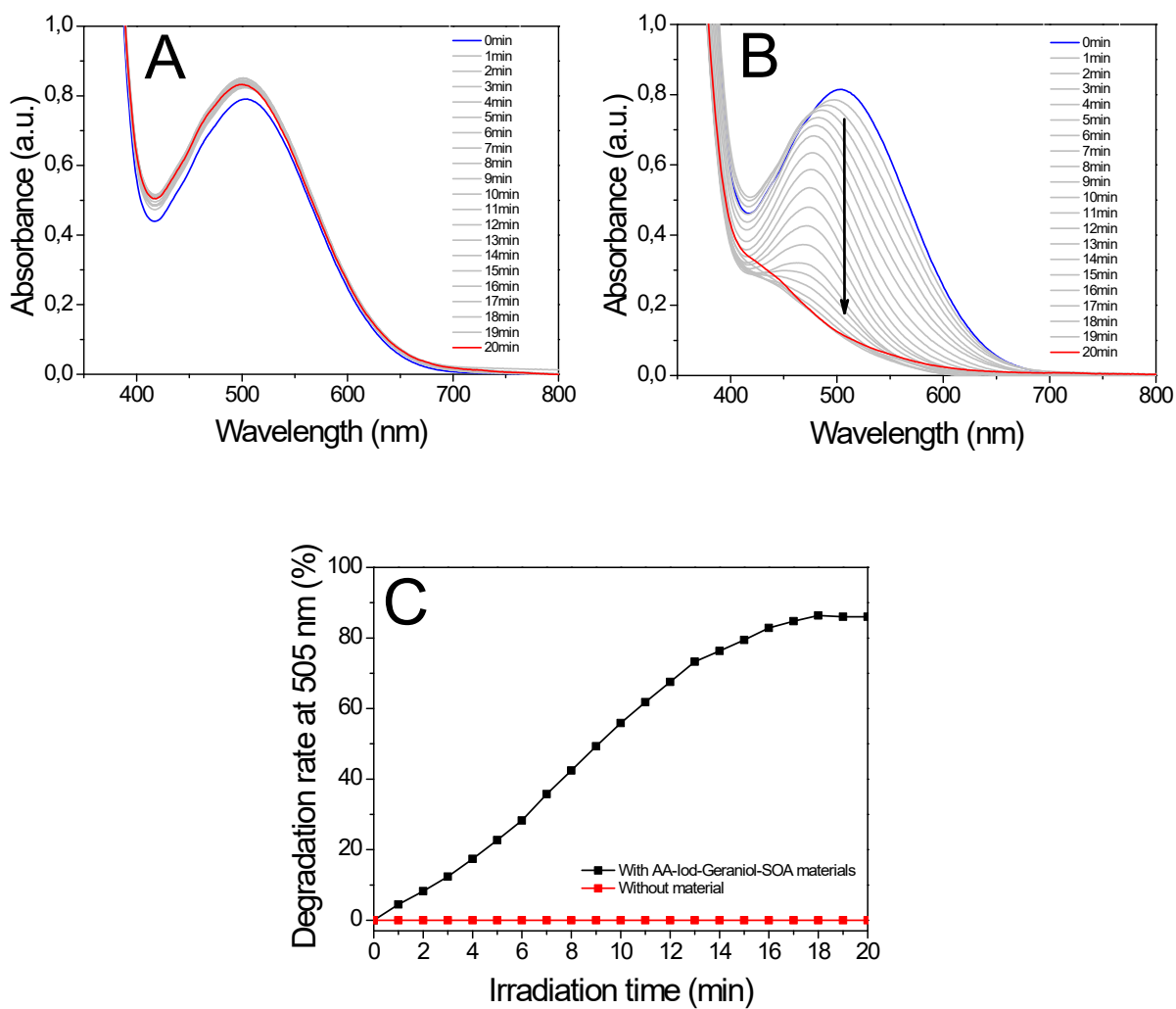
**Figure S18.** Photo-rheology measurement results for the AA/Iod/SOA formulation illustrating the inter-relationships between the storage modulus ( $G'$ ), loss modulus ( $G''$ ), and normal force during the photopolymerization process, allowing the gelation point to be determined. The measurements were performed using a LED@405 nm light source. The experiment lasted a total of 600 s, and the LED light was turned on after 60 s.



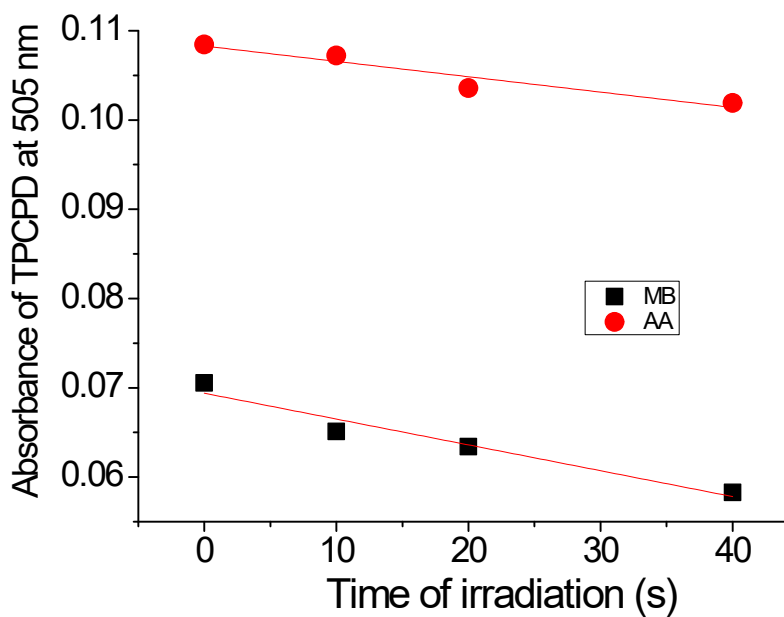
**Figure S19.** Photo-rheology measurement results for the AA/Iod/geraniol/SOA sample, illustrating the inter-relationships between storage modulus ( $G'$ ), loss modulus ( $G''$ ), and normal force during the photopolymerization process, which enables the determination of the gel point. The measurements were performed using a LED@405 nm light source. The experiment lasted a total of 600 s, and the LED light was turned on after 60 s.



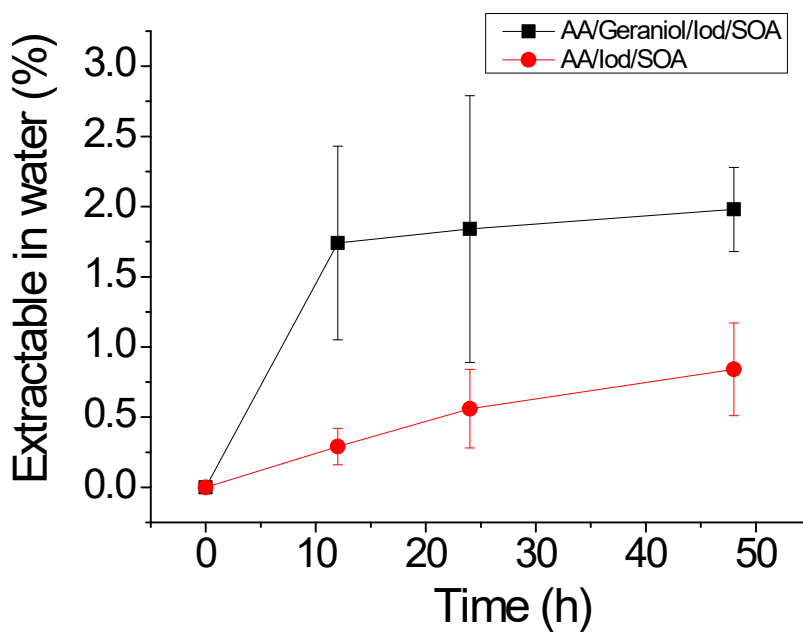
**Figure S20.** Photo-rheology measurement results for the AA/Iod/SOA sample, illustrating the inter-relationships between the storage modulus ( $G'$ ), loss modulus ( $G''$ ), and normal force during the photopolymerization process, which enables the determination of the gel point. The measurement was performed using a LED@455 nm light source. The experiment lasted a total of 600 s, and the LED light was turned on after 60 s.



**Figure S21.** UV-vis spectra of a solution of TPCPD in MeOH **A)** without and **B)** with the presence of AA/Iod/geraniol/SOA pellet after 20 min of LED@405 nm exposure.



**Figure S22.** Decrease of the absorbance of TPCPD after its oxidation by  $^1\text{O}_2$  in DMF using methylene blue (MB) and AA under LED@405nm.  $[\text{AA}] = 8.32 \times 10^{-6} \text{ M}$  and  $[\text{MB}] = 9.38 \times 10^{-6} \text{ M}$ .



**Figure S23.** Extractable fraction (%) from the AA/Geraniol/Iod/SOA and the AA/Iod/SOA based materials after 48h in water.

## TABLES

**Table S1.** Mechanical properties of the AA/Iod/SOA and AA/Iod/geraniol/SOA materials

Samples	E (MPa)	$\sigma_{\max}$ (MPa)	$\epsilon$ (%)	E' (Tg+50°C) (MPa)	Crosslinking density (mol/m <sup>3</sup> )
AA/Iod/SOA	47.27 ± 6.89	1.36 ± 0.59	7.23 ± 3.31	34.87±3.25	4288
AA/Iod/Geraniol/ /SOA	7.24 ± 0.38	0.21 ± 0.08	4.54 ± 1.55	3.51±0.29	452