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Original

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Supporting Information

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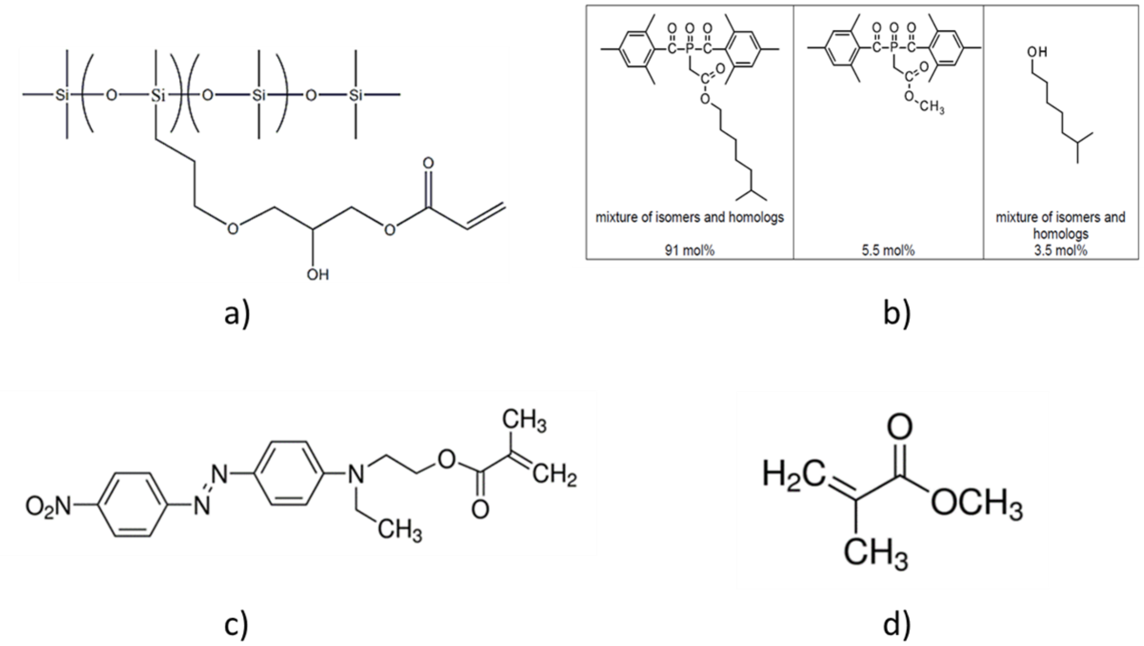

a) b) c) d)

Figure SI 1. Chemical structure of TegoRAD 2800 a), BAPO-Si b), dispersed red one methacrylate c) and methyl methacrylate d).

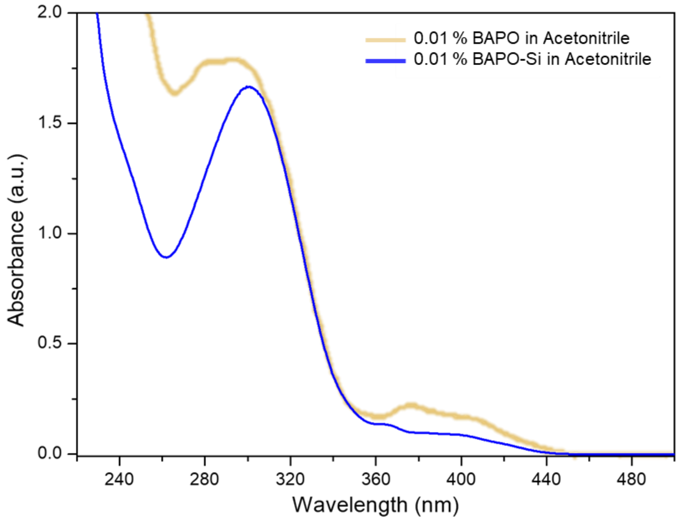

Figure SI 2. Absorbance spectra of BAPO-Si photoinitiator compared to photoinitiator BAPO 819, commonly used for 3D printing applications.

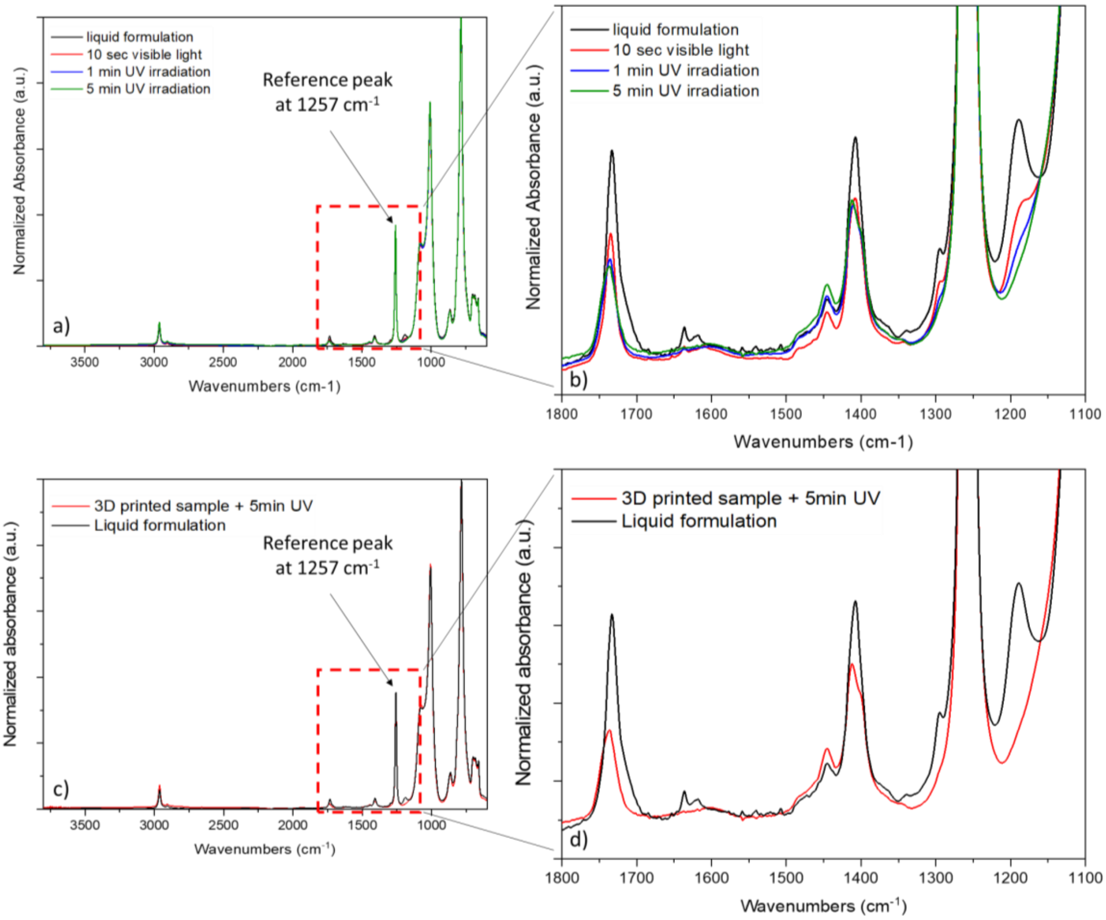

Figure SI 3. a) Full normalized ATR-FTIR spectra recorded on liquid TRAD formulation and after different irradiation conditions, and b) zoomed in the region between 1800-1100 cm^{-1}. c) Full normalized ATR-FTIR spectra of 3D printed TRAD samples and after 5 min of UV post-curing treatment compared to liquid formulation, and d) zoomed in the region between 1800-1100 cm $^{-1}$.

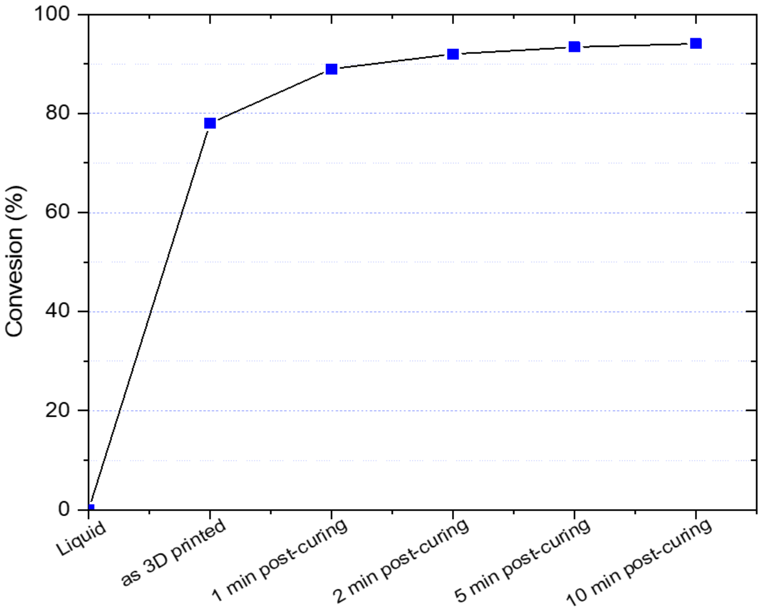

Figure SI 4. Acrylate double-bond conversion (%) after different UV post-curing times (in air), obtained by following the decrease of the peat at 1196 cm^{-1}, whose vibration is modified by the opening of acrylate double bonds after photopolymerization [R1].

ATR-FTIR experiments were performed on 3D printed TRAD samples (5mm x 5mm x 1mm, *lwh*) as printed and after different UV post-curing times. To better represent the evolution of the curing reaction, the printed samples were post cured exposing only their upper side to UV light. ATR spectra were then collected on the lower side that was not directly exposed to UV. As observed, 5 minutes of post curing were enough to reach the maximum possible conversion of the acrylic double bond (all curing experiments in air). The acrylate double bond conversions was evaluated by following the decrease of the peak area of the single carbon-oxygen bond of acrylates moieties at 1196 cm^{-1}, whose vibration is modified by the opening of acrylate double bonds after photopolymerization. [R1] The area of the acrylate peak was normalized by a constant signal in the spectra centered at 1257 cm^{-1} corresponding to methyl siloxane stretching vibrations. [R2]

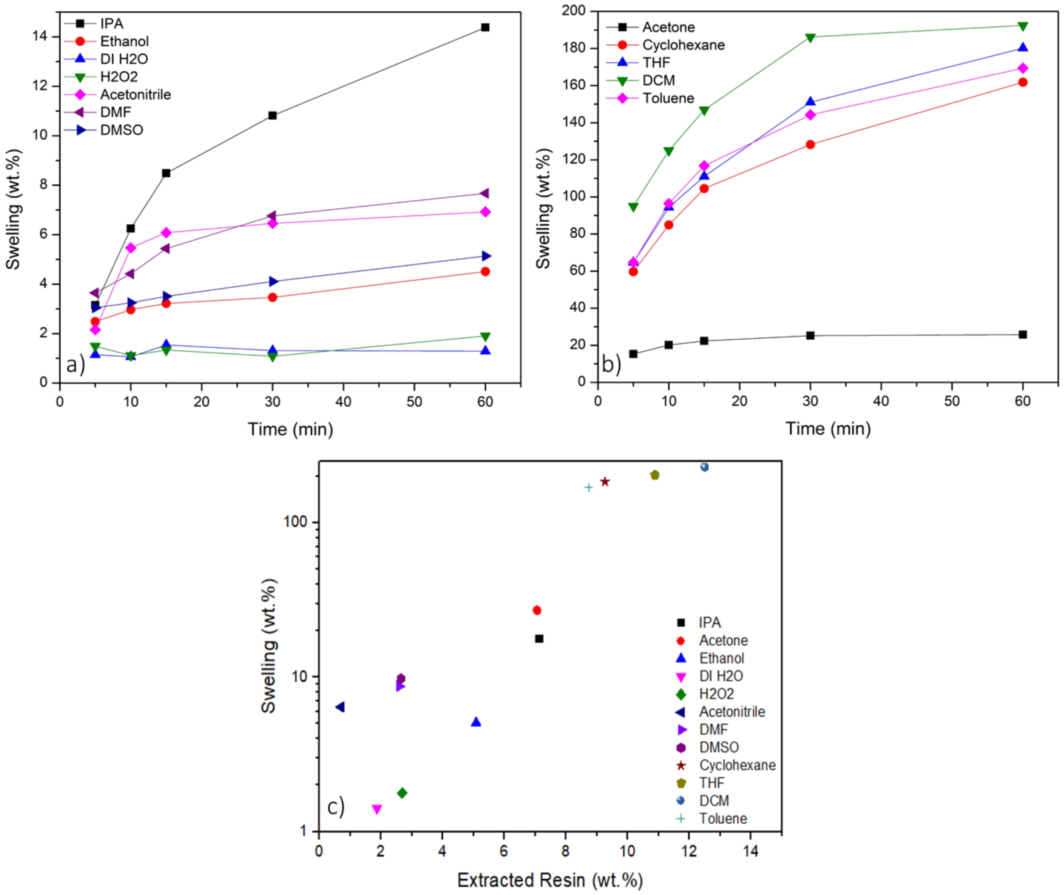

Figure SI 5. a,b) Swelling percentage (wt.%) vs time (min) curves for 3D printed TRAD samples after immersion in different solvents, c) Scatter plot of the swelling percentage (wt.%) vs extracted resin percentage (wt.%) for 3D-printed TRAD samples after 24-hours of immersion in different solvents.

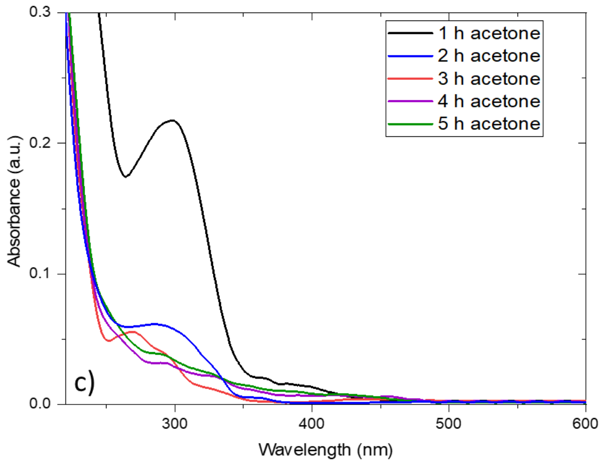

Figure SI 6. UV-VIS spectra of acetone used to extract unreacted material from 3DP TRAD samples.

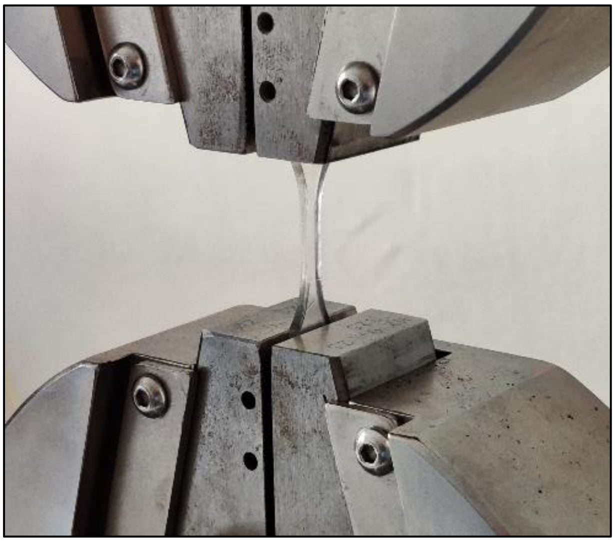

Figure SI 7. 3D printed TRAD dog-bone samples (with a gage length of 20 mm) during dynamo mechanical test.

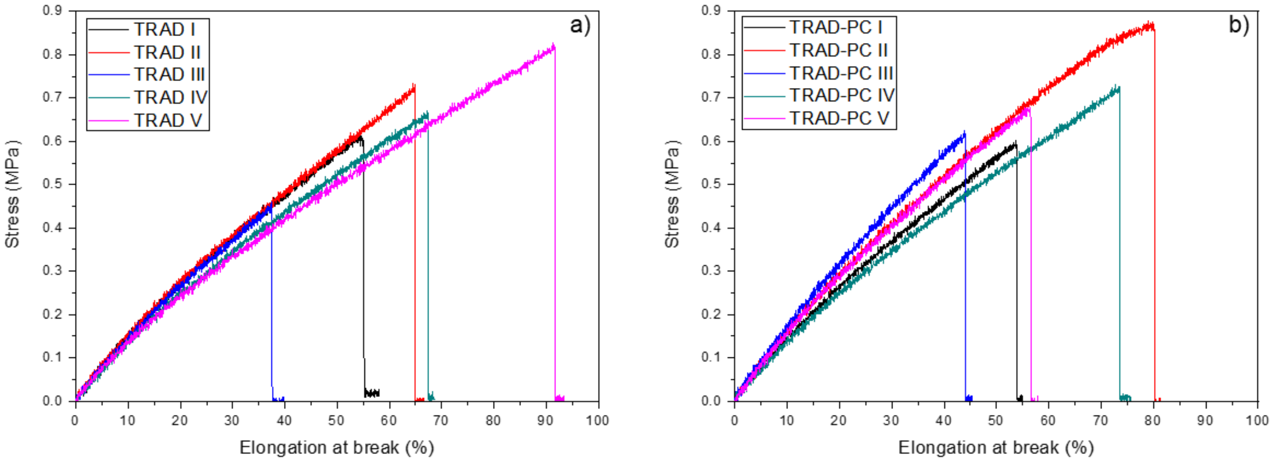

Figure SI 8. Curves of stress (MPa) vs elongation at break (%) for a) just 3D printed TRAD samples and b) 5 min post-cured TRAD samples

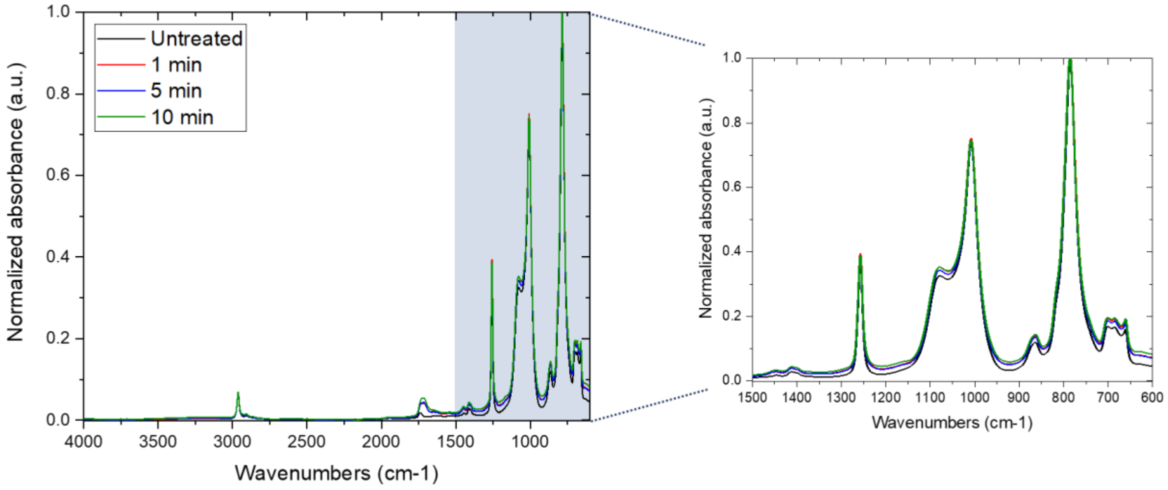

Figure SI 9. Normalized spectra recorded on TRAD samples after different UV-induced grafting polymerization times. The spectra were normalized using the 790 cm^{-1} band corresponding to the Si-C asymmetrical bending or rocking vibration.

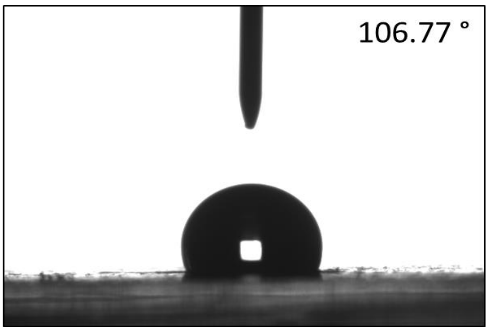

Figure SI 9. Contact angle measurement for 3D printed sample with functionalization process performed after post curing-step.

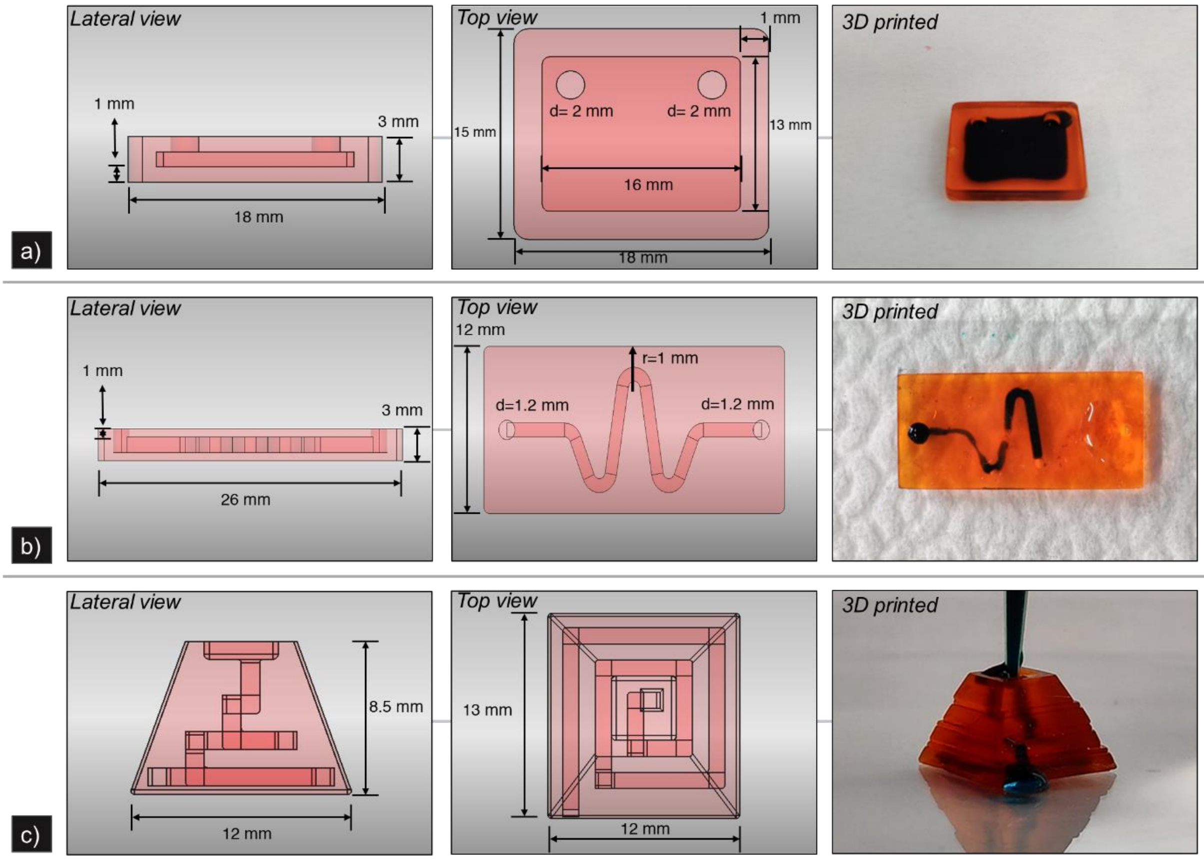

Figure SI 11. CAD designs and photographs of a) 3D printed chip with an internal cavity (16x13x1 mm^3) used for UV-induced grafting polymerization filled with green colored water, b) 3D printed chip with a s-shaped microchannel (1x1 mm^2) used for UV-induced grafting polymerization filled with green colored water and silicon oil and c) 3D printed trapezoidal microfluidic device with a dye liquid passing through its channel (1x1 mm^2).

Reference

[R1] F. Masson, C. Decker, S. Andre, X. Andrieu, *Prog. Org. Coatings* **2004**, *49*, 1.

[R2] J. Palaganas, A. C. de Leon, J. Mangadlao, N. Palaganas, A. Mael, Y. J. Lee, H. Y. Lai, R. Advincula, *Macromol. Mater. Eng.* **2017**, *302*, 1.