Supporting information

NIR Photothermal Activation in Epoxy/Thiol Polymerization

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Table S1. Overview of the chemical compounds used in this study.

	Full names	Abbreviations	Molar masses (g.mol^{-1})	Weight Content	CAS
Thermal initiator	1,3-Dimesitylimidazolium-2-carboxylate	NHC-G	348.45	0.5 phr	675877-56-2
	Bis(2,4-pentanedionato) zinc (II)	Zn 1	263.60	0.5 phr	14024-63-6
	Zinc (II) acetate hydrate	Zn 2	219.51	0.5 phr	5970-45-6
	Manganese (III) acetylacetonate	Mn 1	352.26	0.5 phr	14284-89-0
	Manganese (III) acetate dihydrate	Mn 2	268.10	0.5 phr	19513-05-4
	Copper (II) acetate monohydrate	Cu	199.65	0.5 phr	6046-93-1
	Tetrakis(acetylacetonato) zirconium (IV)	Zr	487.66	0.5 phr	17501-44-9
	Iron (III) Stearate	Fe	906.27	0.5 phr	
Photoinitiator	2-Isopropylthioxanthone	2-ITX	254.35	0.5 phr	5495-84-1
NIR dyes	The NIR dyes 2-(2-(3-(2-(1,3-dihydro-1,3,3-trimethyl-2*H*-indol-2-ylidene)ethylidene)-2-((1-phenyl-1*H*-tetrazol-5-yl)thio)-1-cyclohexen-1-yl)ethenyl)-1,3,3-trimethyl chloride	IR785		0.1 phr	
	2-[2-[2-chloro-3-[2-(1,3-dihydro-1,1,3-trimethyl-2*H*-benz[*e*]indol-2-ylidene)ethylidene]-1-cyclohexen-1-	IR813		0.1 phr	134127-48-3

	yl]ethenyl]-1,1,3-trimethyl-1*H*-benz[*e*]indolium 4-Methylbenzenesulfonate				
Thiols	Pentaerythritol tetrakis (3-mercaptopropionate)	PETMP	488.66	42wt%	7575-23-7
	Tris[2-(3-mercaptopropionyloxy) ethyl] Isocyanurate	TEMPIC	525.61	50wt%	36196-44-8
	Ethylene glycol *bis*(3-mercaptopropionate)	GDMP	238.32	42wt%	22504-50-3
EPOXY	Bisphenol A diglycidyl ether	BADGE	340.4	50wt%[a] 58wt%	1675-54-3

a) 42 wt% for PETMP and GDMP and 50 wt% for TEMPIC. phr of the chromophores are relative to the total amount of resin (thiol and epoxy)

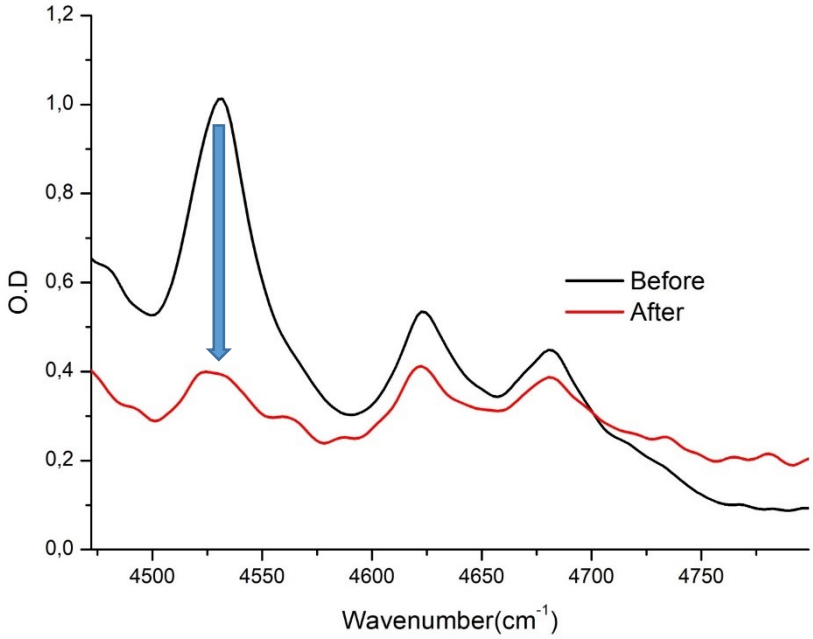

Figure S1. Examples of FTIR spectra before and after polymerization.

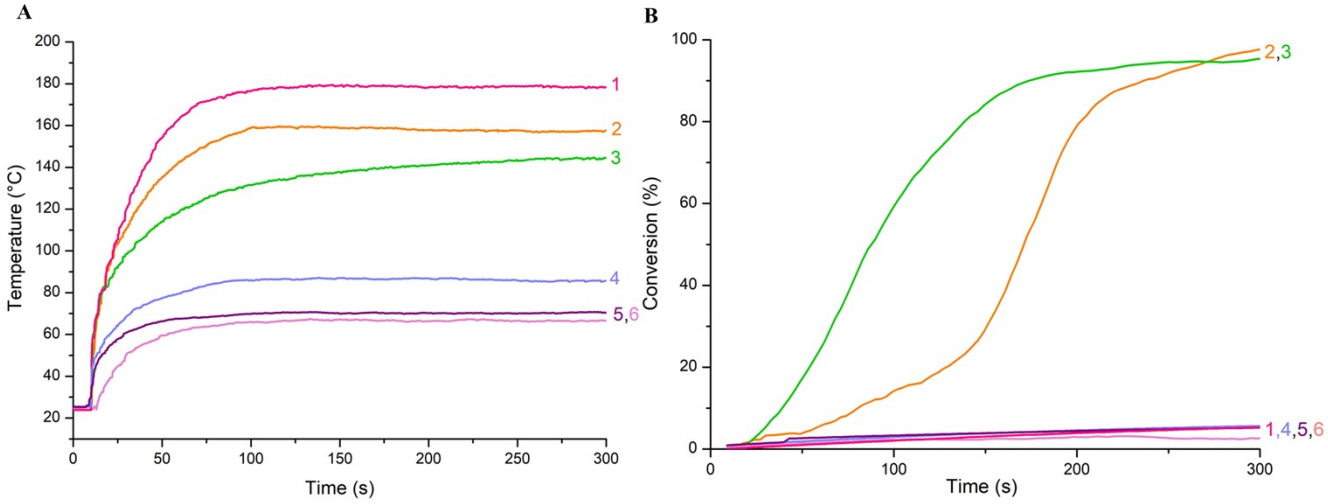

Figure S2. **(A)** Temperature profiles for Epoxy/PETMP blend (58/42 (wt%/ wt%)) and corresponding/simultaneous (**B**) Photopolymerization profiles (epoxy functions conversion in relation to irradiation time) for irradiation by Laser Diode@785 nm (0.4 W cm^{-2}) in presence of (1) 0.1 phr IR785; (2) 0.1 phr IR785 and 0.5 phr Zn 1; (3) 0.1 phr IR785 and 0.5 phr Zn 2; (4) 0.5 phr Zn 1; (5) 0.5 phr Zn 2; and (6) without both IR785 and thermal initiator. The irradiation starts at t = 10s.

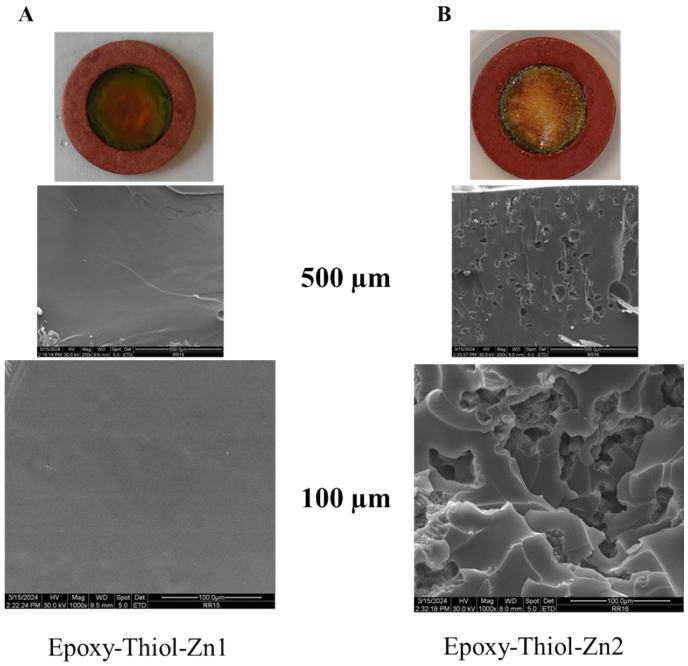

Figure S3. SEM Analysis of polymers post-irradiation: (A) Epoxy/Thiol/Zn 1 and (B) Epoxy/Thiol/Zn 2.

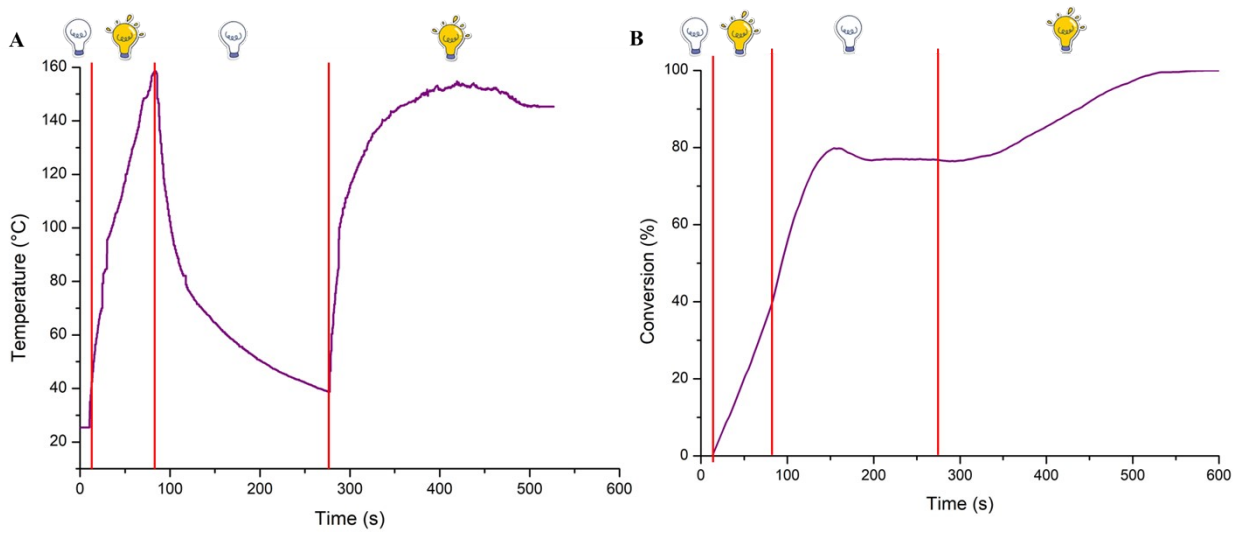

Figure S4. (**A**) Temperature profiles for Epoxy/PETMP blend (58/42 (wt%/ wt%)) and corresponding/simultaneous (**B**) Photopolymerization profiles (epoxy functions conversion in relation to irradiation time) for irradiation by Laser Diode@785 nm (0.4 W cm^{-2}) in presence of 0.1 phr IR785 and 0.5 phr Zn 1. The irradiation starts at t = 10s.

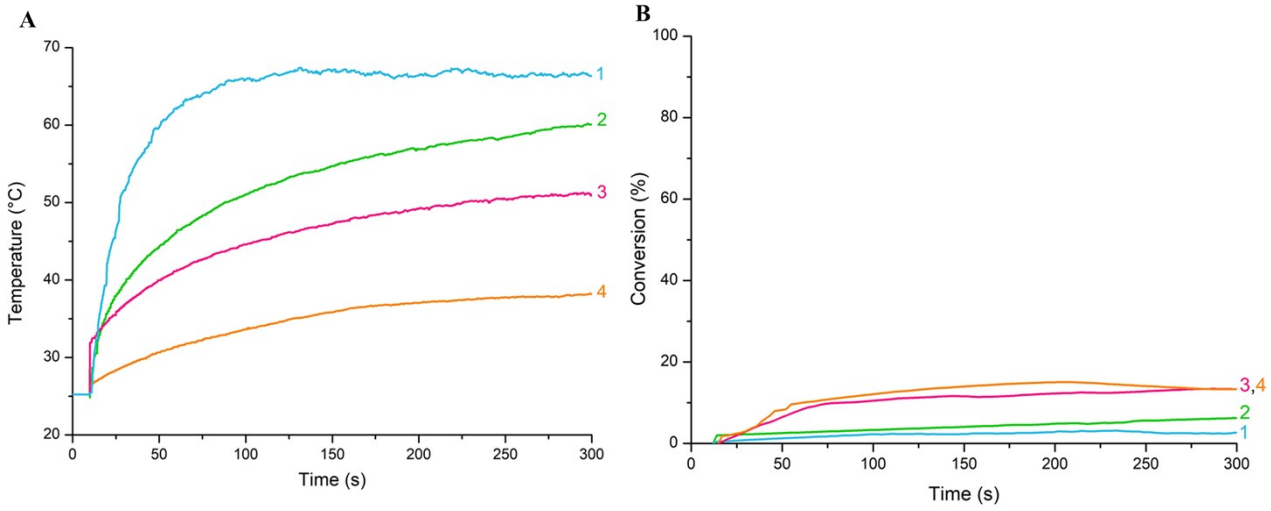

Figure S5. (**A**) Temperature profiles for Epoxy/ PETMP blend (58/42 (wt%/ wt%)) and corresponding/simultaneous (**B**) Photopolymerization profiles (epoxy functions conversion in relation to irradiation time) for irradiation by Laser Diode@785 nm (0.4 W cm^{-2}) in presence of (1) without both dye and thermal initiator; (2) 0.5 phr Fe; (3) 0.5 phr Mn 1; (4) 0.5 phr Mn 2. The irradiation starts at t = 10s.

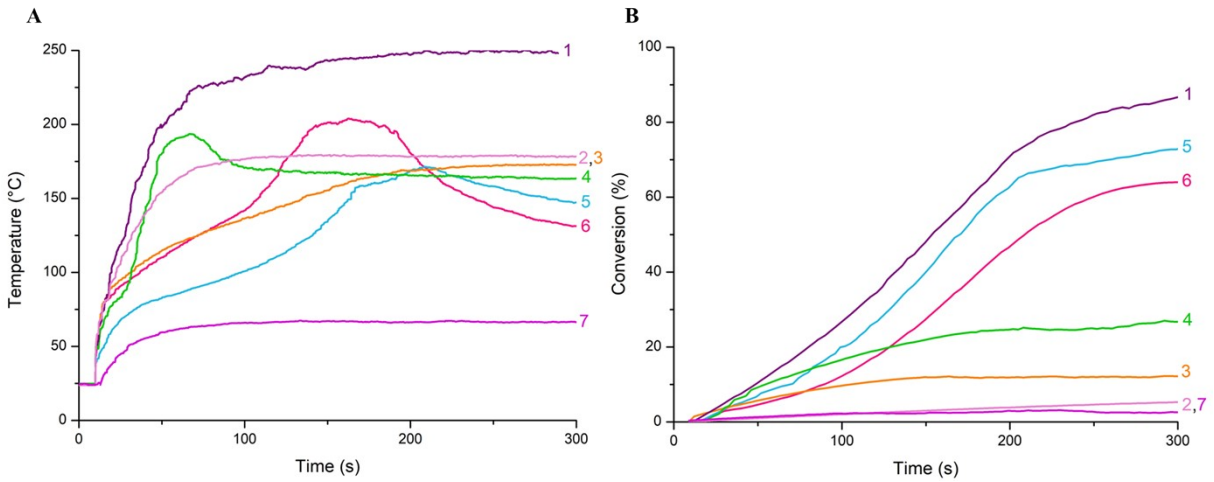

Figure S6. (**A)** Temperature profiles for Epoxy/ PETMP blend (58/42 (wt%/ wt%)) and corresponding/simultaneous (**B**) Photopolymerization profiles (epoxy functions conversion in relation to irradiation time) for irradiation by Laser Diode@785 nm (0.4 W cm^{-2}) in presence of (1) 0.1 phr IR785 and 0.5 phr Fe; (2) 0.1 phr IR785 and 0.5 phr Cu; (3) 0.1 phr IR785; (4) 0.1 phr IR785 and 0.5 phr Zr; (5) 0.1 phr IR785 and 0.5 phr Mn 1; (6) 0.1 phr IR785 and 0.5 phr Mn 2; and (7) without both IR785 and thermal initiator. The irradiation starts at t = 10s.