A Fully Biomass Content Monomer from Itaconic Acid and Eugenol to Build Degradable Thermosets via Thiol-ene Click Chemistry

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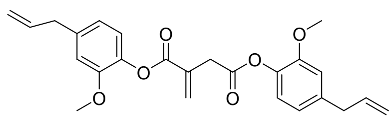
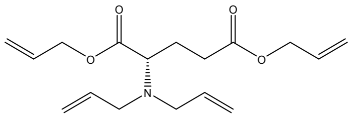
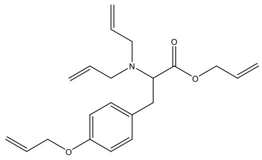
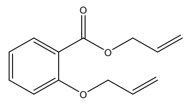
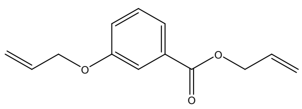
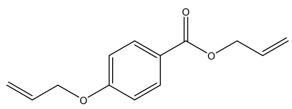
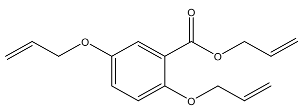
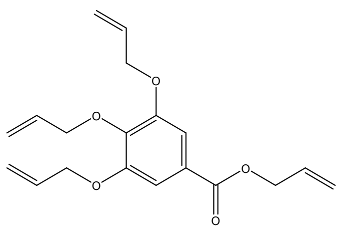
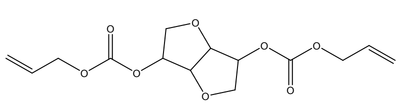
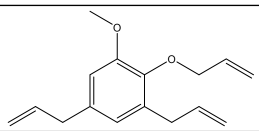
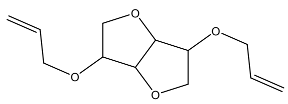
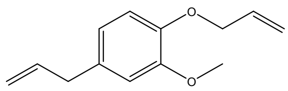
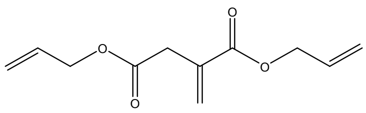
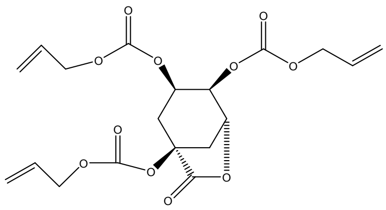
Table S1. The biobased allyl compound monomers and the T_g, mechanical properties, and biomass content of allyl compound of thiol-ene crosslinking network structures

Name	Chemical structure	T_g (°C)	Tensile strength (MPa)	Biomass content of allyl compound	reference
EUIT/4SH		74.0	58.6	100.0%	This work
EUIT/3SH		53.1	26.2		
EUIT/2SH		27.2	6.5		
pA4E-S4P		4.4	2.5	46.6%	[1]
pA4Y-S4P		24.4	18.2	51.9%	
aSA		0.8	2.7	62.4%	[2]
a3HBA		-7.1	1.8	62.4%	
a4HBA		5.5	3.7	62.4%	
aGenA		-5.7	2.7	55.1%	
aGalA		-7.4	2.1	50.3%	
IDA-co-TMPTMP		15.8	7.8	45.9%	[3]
DADG-PS4P		8.1	0.5	66.4%	[4]

ISODIAL		-2	2.0	63.7%	5
EAE		-2.4	2.1	79.9%	6
DIA		8.6	4.7	60.9%	
TEGBMP-co-TAQA		-18	Nd	40.1%	7
TMPTMP-co-TAQA		43	~39		
1,6-HDT-co-TAQA		48	~30		
2,3-BDT-co-TAQA		51	~50		
1,2-EDT-co-TAQA		65	~40		

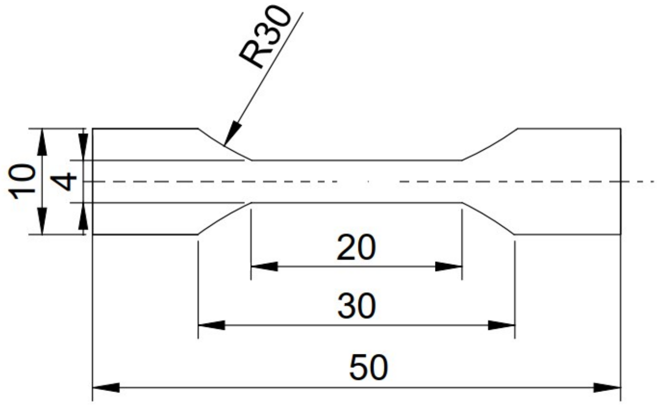


Figure S1. The sample size for tensile testing (unit: mm)

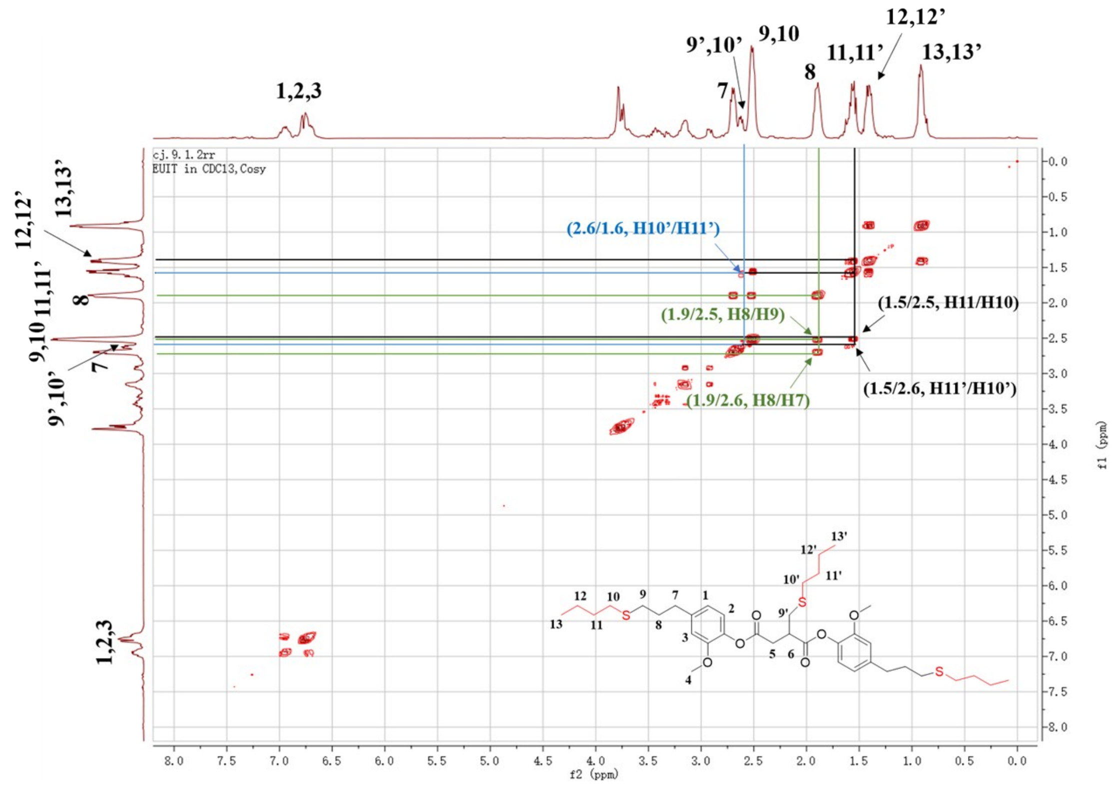


Figure S2. The H-H COSY NMR spectra of EUIT-nBM

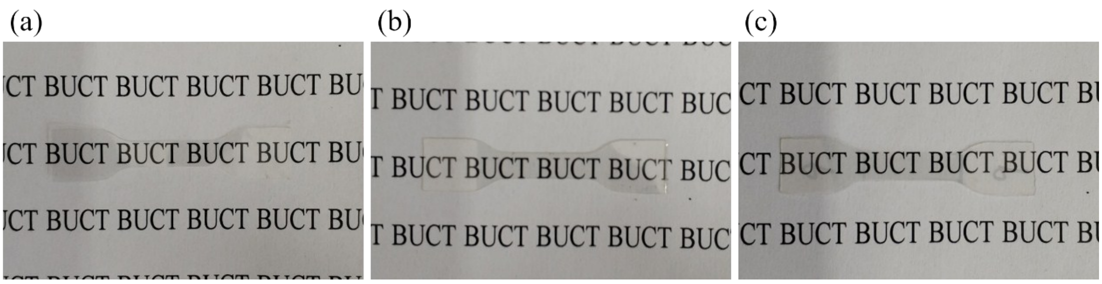


Figure S3. Visualization images of (a) EUIT/4SH, (b) EUIT/3SH, and (c) EUIT/2SH

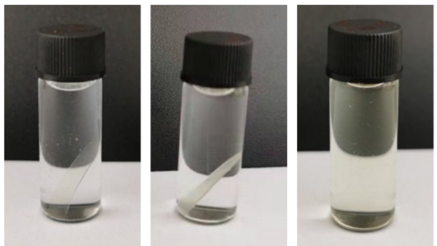
Table S2. Degradation time for EUIT/SH with different sodium hydroxide solution at room temperature and 90 ^{o}C

Sample / Degradation conditions	EUIT/2SH	EUIT/3SH	EUIT/4SH
1 M NaOH (25 ^{o}C)	N/A [a]	N/A [a]	N/A [a]

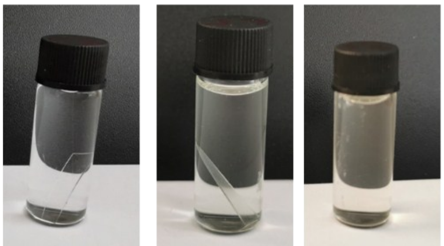
6 M NaOH (25 ^{o}C)	>2 months [b]	>2 months [b]	>2 months [b]
1 M NaOH (90 ^{o}C)	300 min	420 min	480 min
6 M NaOH (90 ^{o}C)	30 min	120 min	120 min

a. Two months in solution and no degradation occurred. b. Time when some degradation occurred (5% weight loss).

The degradation of EUIT/2SH at 90 ^{o}C for 30 min



The degradation of EUIT/3SH at 90 ^{o}C for 120 min



The degradation of EUIT/4SH at 90 ^{o}C for 120 min

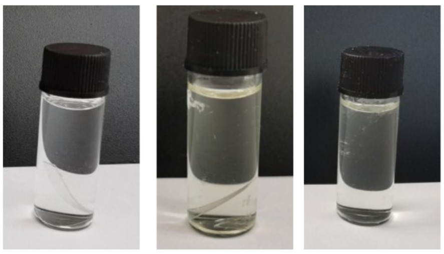


Figure S4. Degradation of the thiol-ene crosslinked networks at 90 °C at 6M NaOH

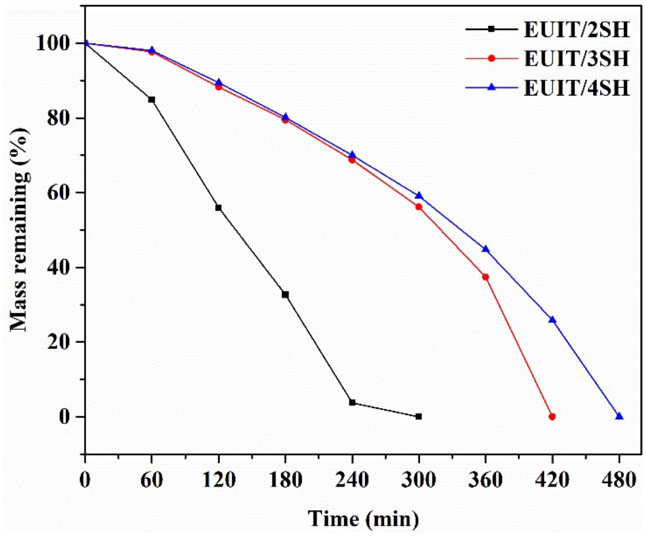


Figure S5. The weight loss studies of EUIT/SH (1M at 90 ^{o}C)

References

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