

Supplementary Materials

Construction of Bio-based Polyurethane via Olefin Metathesis and Their Thermal Reversible Behavior

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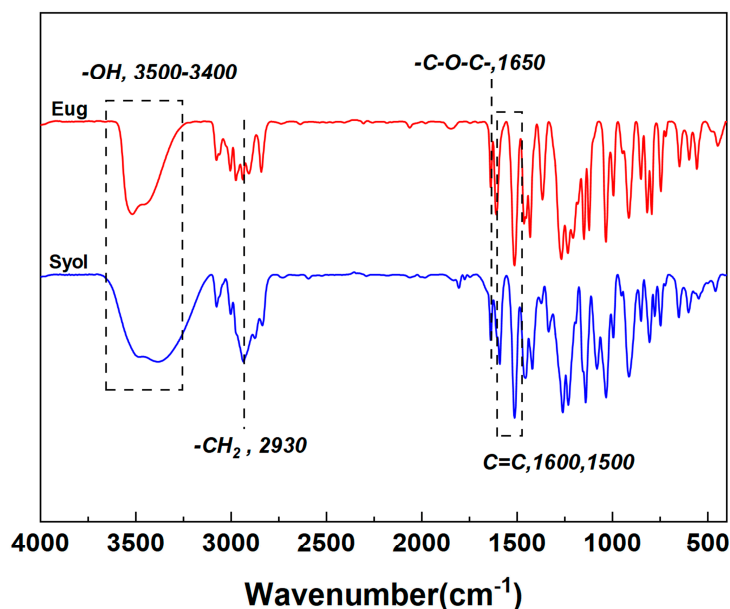


Figure S1. IR spectra of Eug and Syol.

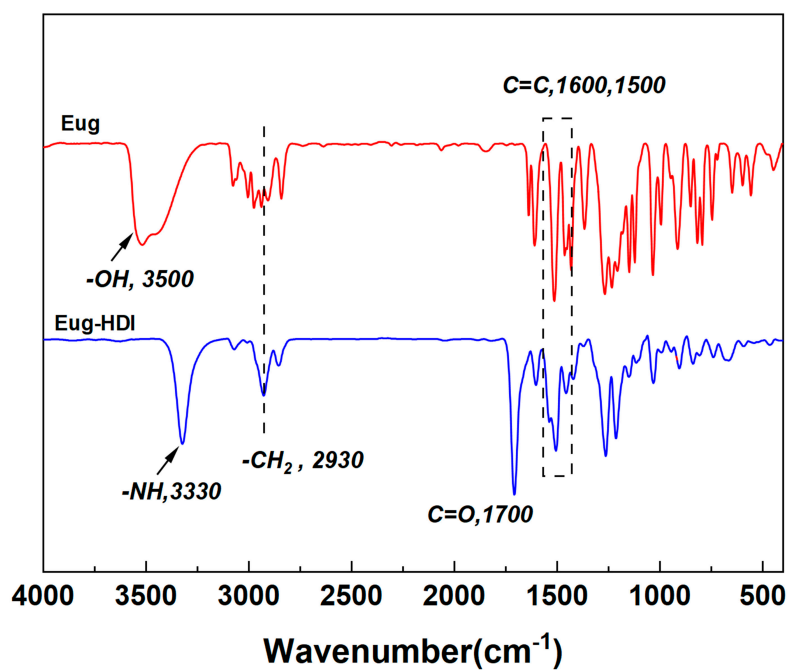


Figure S2. IR spectra of Eug and Eug-HDI.

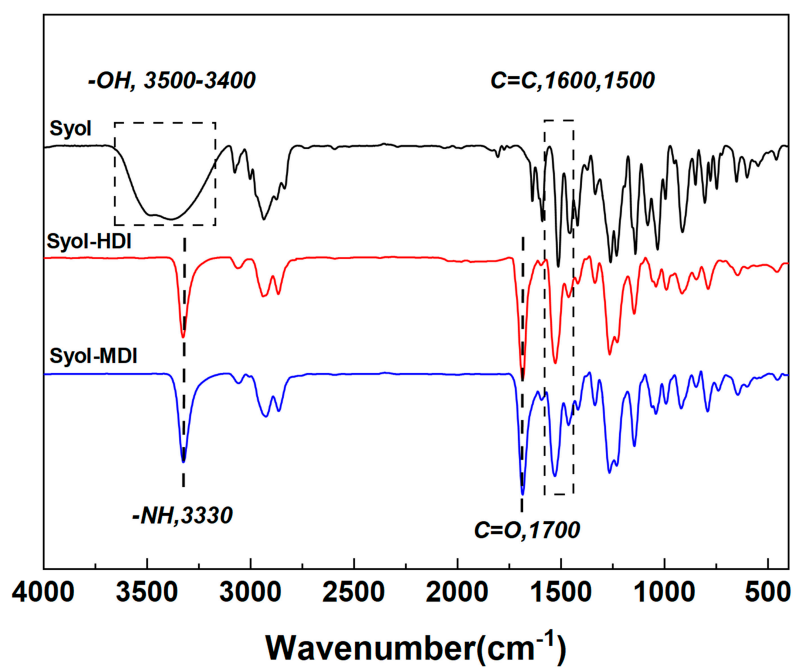


Figure S3. IR spectra of Syol, Syol-HDI and Syol-MDI.

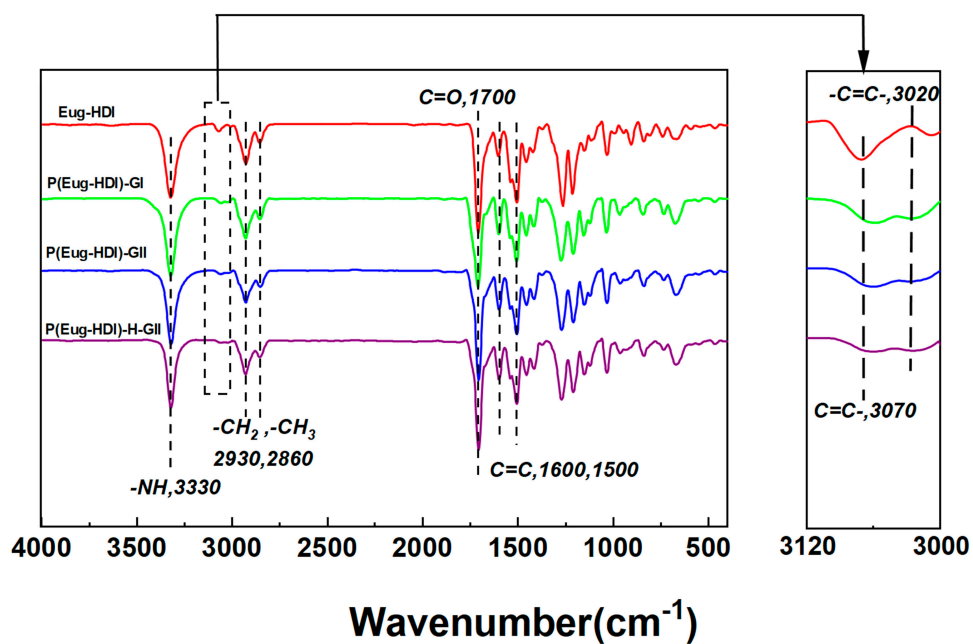


Figure S4. IR spectra of Eug-HDI and P(Eug-HDI) under different catalysts.

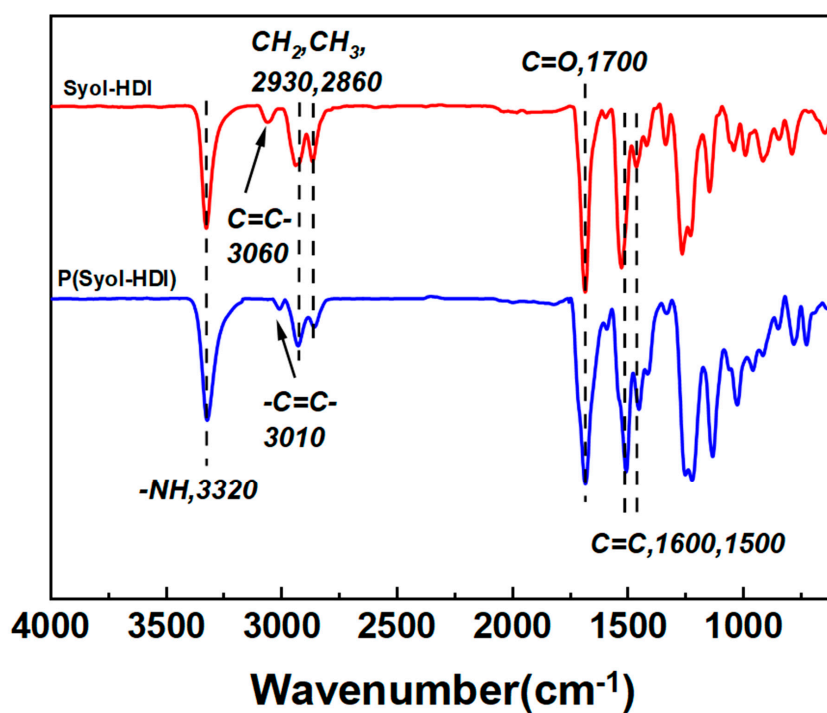


Figure S5. IR spectra of Syol-HDI and P(Syol -HDI).

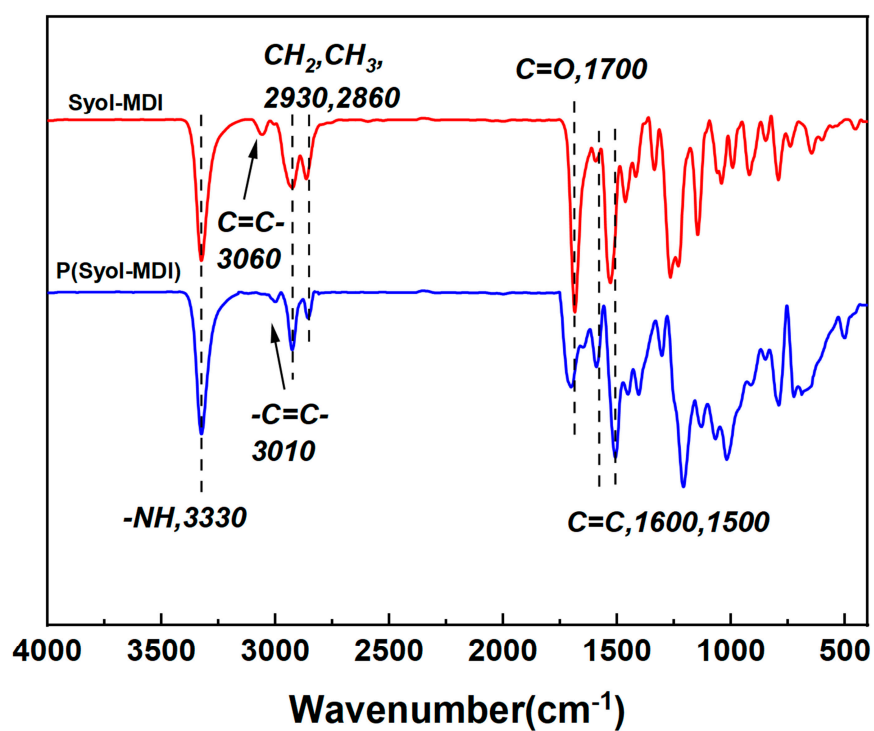


Figure S6. IR spectra of Syol-MDI and P(Syol - MDI).

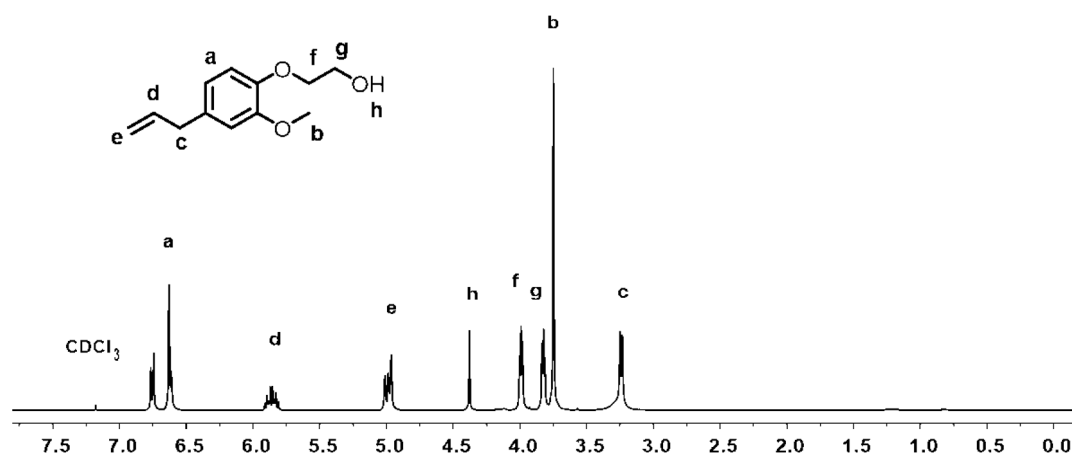
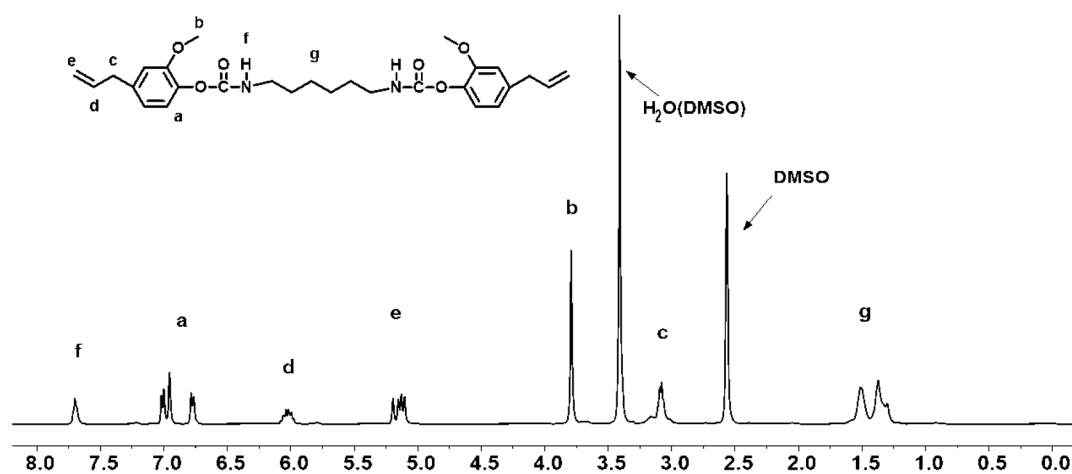
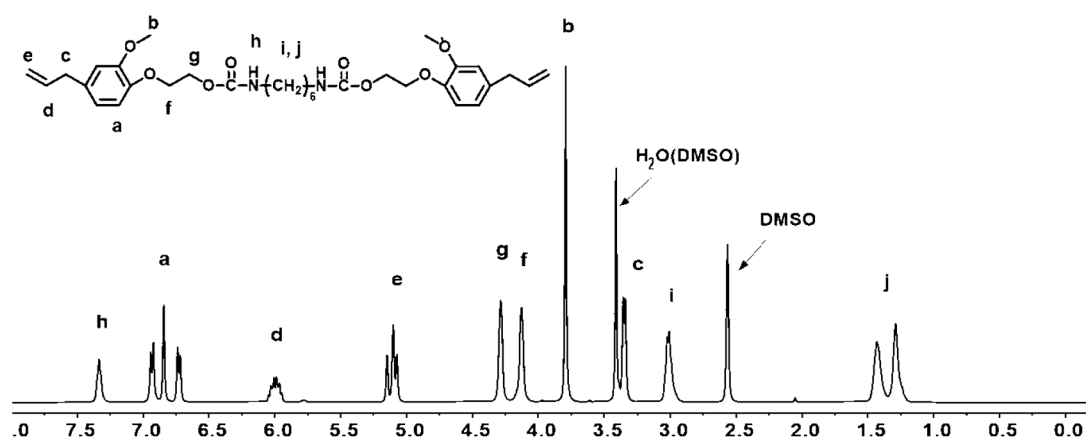
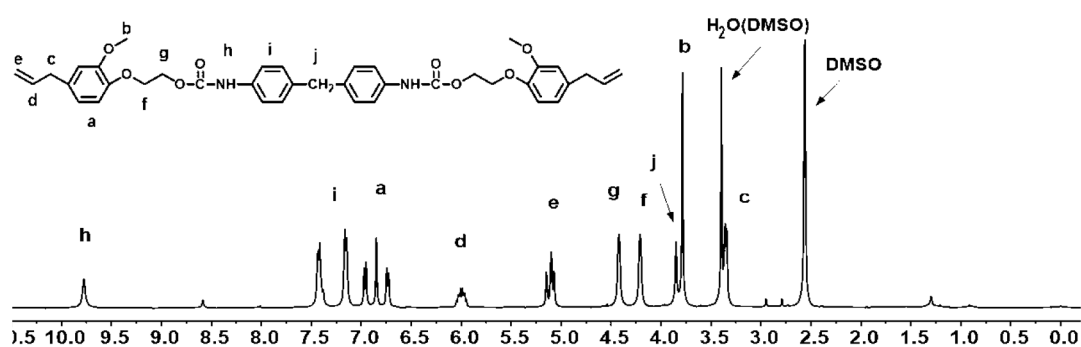


Figure S7. The ¹H NMR spectrum of Syol.

Figure S8. The ¹H NMR spectrum of Eug-HDI.Figure S9. The ¹H NMR spectrum of Syol-HDI.Figure S10. The ¹H NMR spectrum of Syol-MDI.

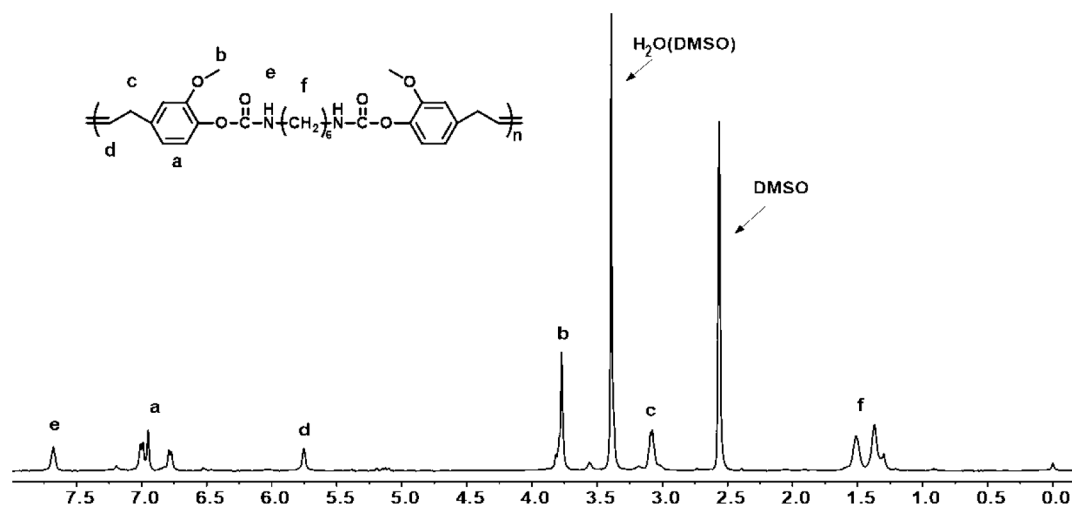


Figure S11. The ¹H NMR spectrum of P(Eug-HDI).

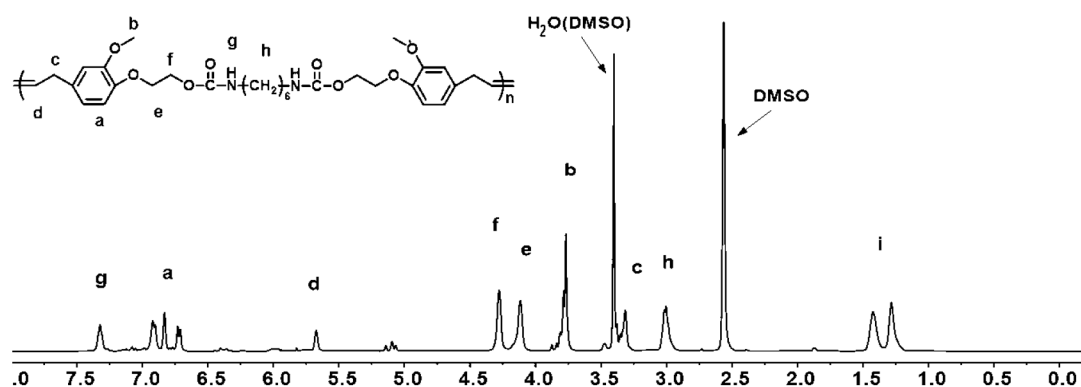


Figure S12. The ¹H NMR spectrum of P(Syol-HDI).

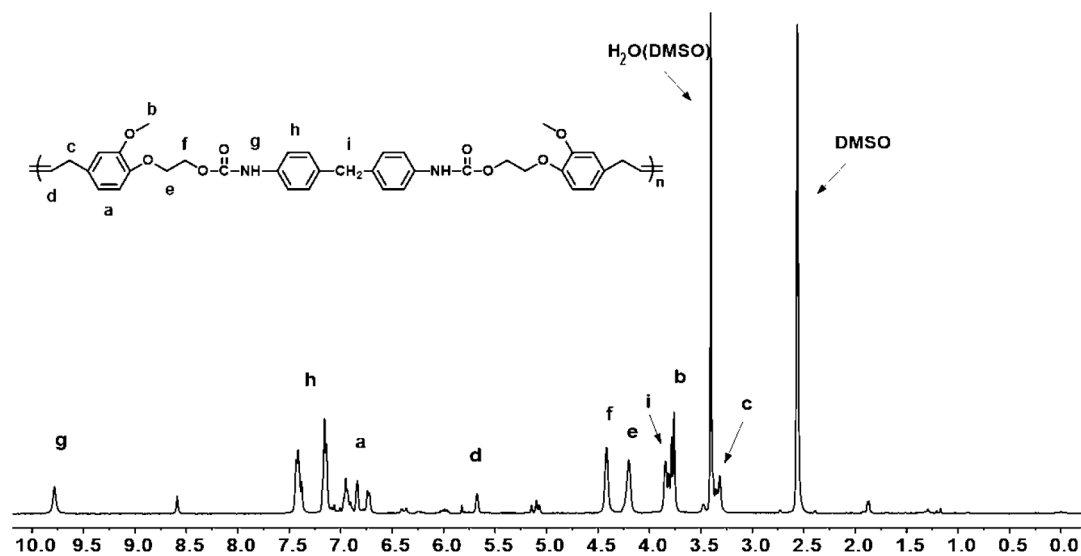


Figure S13. The ¹H NMR spectrum of P(Syol-MDI).

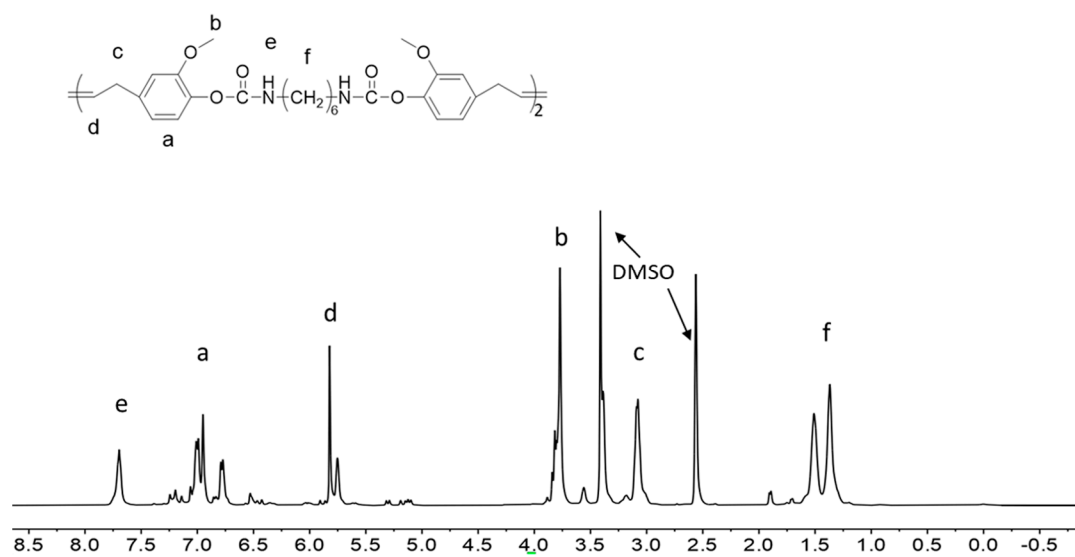


Figure S14. The ^1H NMR spectrum of product in methanol filtrate by dried by rotary evaporation.

Table S1. Olefin metathesis polymerization of Eug-HDI under different solvents, temperatures and reaction times.

En-try	Eug-HDI/Cat. (molar ratio)	Solvent (8ml)	T (°C)	t (h)	Conv. (%)	M_n (g/mol)	\bar{D}	n
1	100/1	THF	40	6	1.0	3000	1.40	6
2	100/1	THF	50	6	21.6	3100	1.36	6
3	100/1	THF	60	6	39.5	3300	1.33	7
4	100/1	THF	65	6	35.9	3400	1.44	7
5	100/1	TOL	40	6	10.0	2000	1.25	4
6	100/1	TOL	50	6	39.8	2000	1.28	4
7	100/1	TOL	60	6	63.5	2300	1.31	5
8	100/1	TOL	80	6	60.3	2600	1.53	6
9	100/1	TOL	100	6	57.6	2900	1.31	6
10	100/1	DCE	20	6	2.2	2000	1.21	4
11	100/1	DCE	30	6	29.4	2300	1.33	5
12	100/1	DCE	40	6	64.7	4400	1.41	9
13	100/1	DCE	50	6	60.5	4500	1.46	9
14	100/1	DCE	60	6	53.7	4700	1.44	10
15	100/1	DCE	80	6	41.9	5200	1.63	11
16	100/1	DCE	40	1.5	35.2	2700	1.46	5
17	100/1	DCE	40	3	37.4	3000	1.38	6
18	100/1	DCE	40	6	64.7	4400	1.41	9
19	100/1	DCE	40	9	64.7	3800	1.49	8
20	100/1	DCE	40	12	56.8	3500	1.52	7

Table S2. Olefin metathesis polymerization of Eug-HDI under different catalyst molar ratios.

Entry	Eug-HDI/Cat. (molar ratio)	Conv. (%)	Mn (g/mol)	\bar{D}	n
1	25/1	14.2	6400	1.26	13
2	50/1	34.3	5500	1.31	11
3	100/1	64.7	4400	1.41	9
4	200/1	44.2	2200	1.26	4
5	400/1	15.2	1600	1.77	3
6	500/1	0.5	1600	1.02	3

Table S3. Olefin metathesis polymerization of Eug-HDI with different metal salts.

Entry	Eug-HDI/Cat. (molar ratio)	Addition	Conv. (%)	Mn ^a (g/mol)	\bar{D} ^b	n ^c
1	100/1	-	64.7	4400	1.41	9
2	100/1	MgCl ₂	37.4	2200	1.23	4
3	100/1	LiI	43.1	2200	1.27	4
4	100/1	NiCl ₂	78.7	3800	1.52	8
5	100/1	NiBr ₂	83.1	3000	1.39	6
6	100/1	NiI ₂	86.6	2500	1.33	5
7	100/1	CuCl ₂	-	-	-	-
8	100/1	CuCl	11.9	2200	1.24	4
9	100/1	CuBr	22.3	2100	1.22	4
10	100/1	CuI	49.9	2200	1.28	4
11	100/1	PPNCl	25.5	2100	1.21	4
12	100/1	PBQ	55.7	3300	1.34	7

a. Mn: number-average molecular weight. b. Dispersion index, used to describe the molecular weight distribution of polymer. c. n: degree of polymerization.