

## Supporting Information

# Fully Bio-Based Acetal Diepoxy Monomers: High Modulus, Good Thermal Stability and Readily Degradability

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## Contents

Figure S1 .....	3
Figure S2 .....	3
Figure S3 .....	4
Figure S4 .....	4
Table S1 .....	5

# 1. Analysis of NMR spectra of synthetic substances

## 1.1 NMR spectra of VX

$^1\text{H}$ -NMR of VX (400 MHz, DMSO- $d_6$ )  $\delta$ =9.04 (s, 1H), 7.00 (s, 1H), 6.97 (s, 1H), 6.90 (d, J=5.4Hz, 1H), 6.87 (d, J=5.4Hz, 1H), 6.77 (d, 1H), 6.75 (d, 1H), 5.56 (s, 1H), 5.51 (s, 1H), 4.76 (t, 1H), 4.09(m, 2H), 3.97(m, 1H) 3.94(t, 1H), 3.84(s, 3H), 3.67-3.58 (m, 1H), 3.58-3.49 (m, 1H).

$^{13}\text{C}$ -NMR of VX (101 MHz, DMSO- $d_6$ )  $\delta$ =147.05, 147.03, 146.87, 146.78, 129.94, 129.77, 119.16, 118.83, 114.84, 110.64, 110.23, 99.73, 99.43, 78.85, 69.65, 69.14, 68.95, 59.52, 55.61, 55.51.

## 1.2 NMR spectra of DGEVX

$^1\text{H}$ -NMR of DGEVX (400 MHz,  $\text{CDCl}_3$ )  $\delta$ =7.19-7.00 (m, 2H), 7.00-6.85 (m, 1H), 5.61 (s, 1H), 5.54 (s, 1H), 4.39 (d, J=8Hz, 1H), 4.28-4.19 (m, 2H), 4.16 (d, J=2.0 Hz, 1H), 4.12 (dd, J =13.7, 11.5 Hz, 1H), 4.05-3.99 (m, 1H), 3.97 (s, 1H), 3.90 (s, 3H), 3.88 (s, 3H), 3.85 (m, 1H), 3.82 (s, 1H), 3.37(s, 2H), 2.89 (t, J=3.8Hz, 2H), 2.76 (dd, J=6.4, 2.6Hz, 2H), 2.00 (dd, J =3.6, 3.2Hz, 1H) .

$^{13}\text{C}$ -NMR of DGEVX (101 MHz,  $\text{CDCl}_3$ )  $\delta$ =149.54, 149.47, 148.76, 148.66, 131.85, 131.68, 119.28, 118.95, 113.88, 113.70, 110.44, 110.15, 100.92, 100.54, 78.84, 72.08, 70.33, 70.32, 70.20, 69.96, 62.03, 55.98, 50.14, 44.97.

## 2. Experimental data images

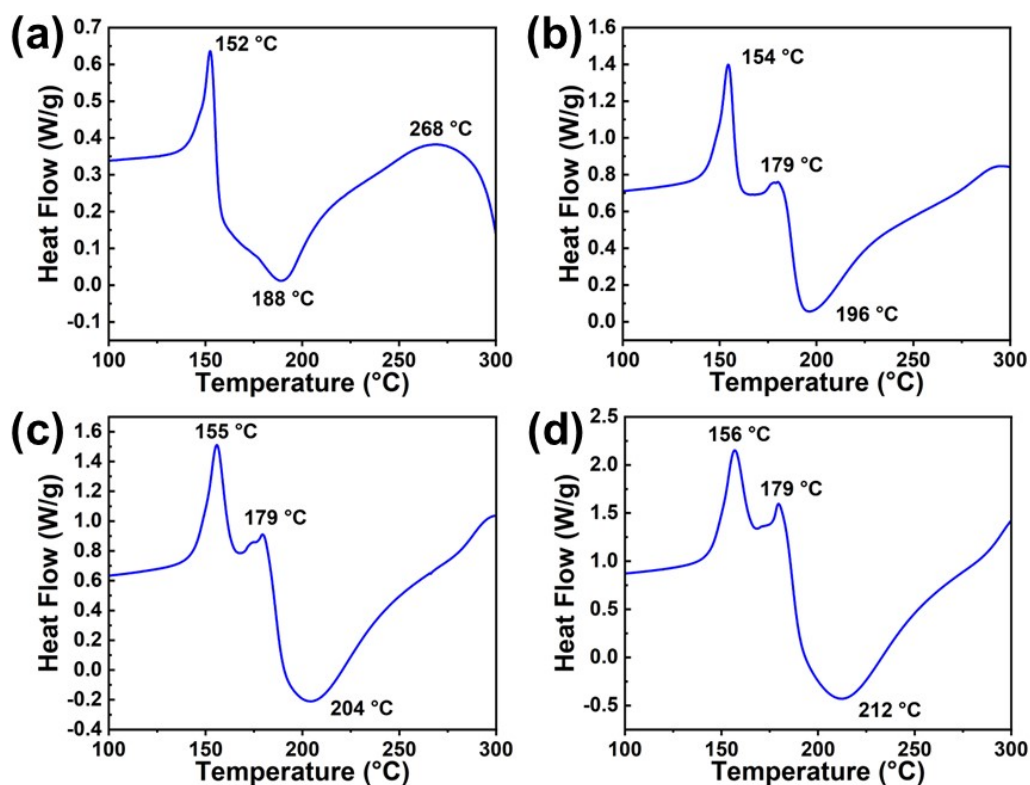


Fig. S1 DSC curves of DGEVX-DDS before curing (a)5 °C/min, (b)10 °C/min, (c)15 °C/min, (d)20 °C/min.

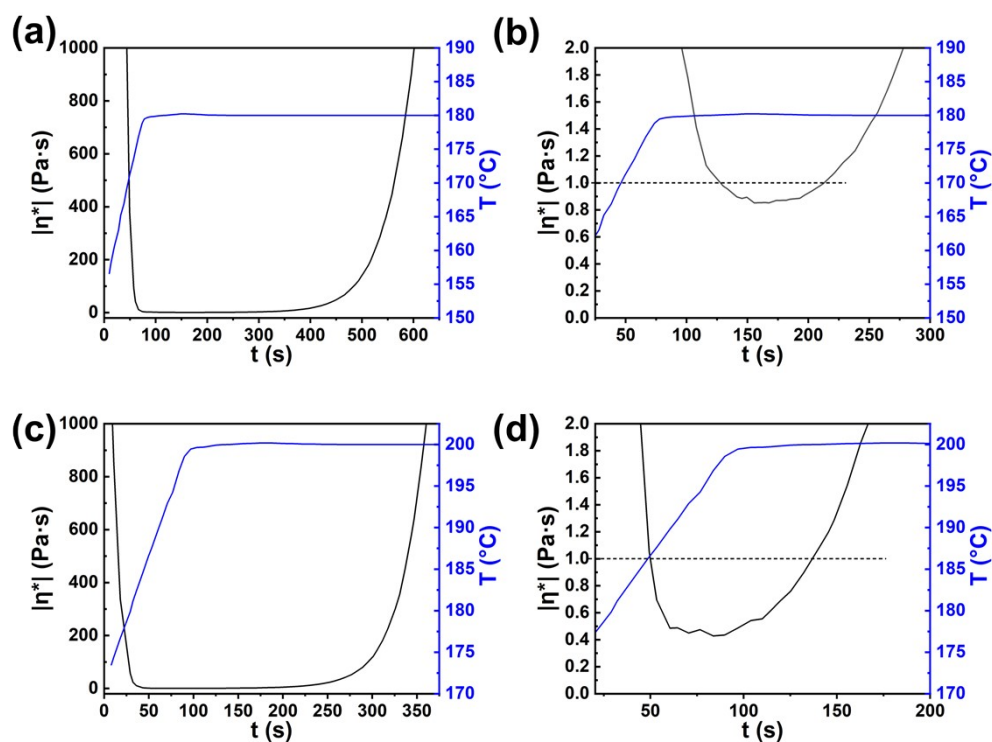


Fig. S2 Viscosity-temperature-time curves of DGEVX-DDS(a)180 °C (b)0-300 s of 180 °C (c)200 °C (d)0-200 s of 200 °C

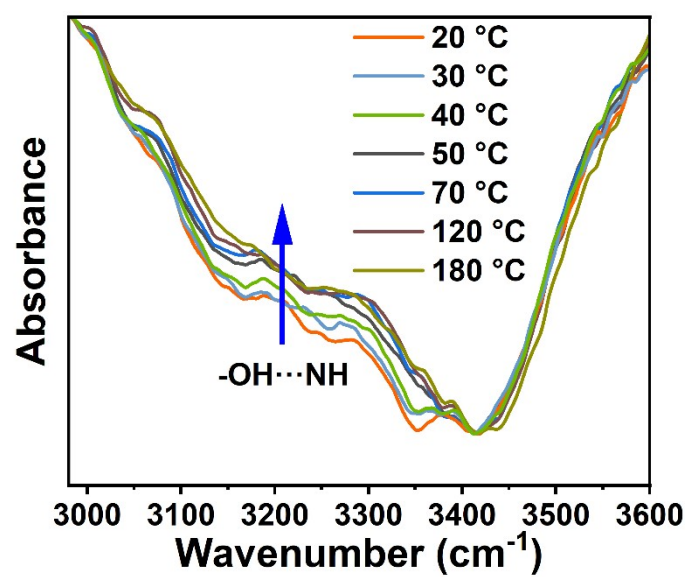


Fig. S3 In situ FT-IR spectroscopy of DGEVX-DDS cross-linked network.

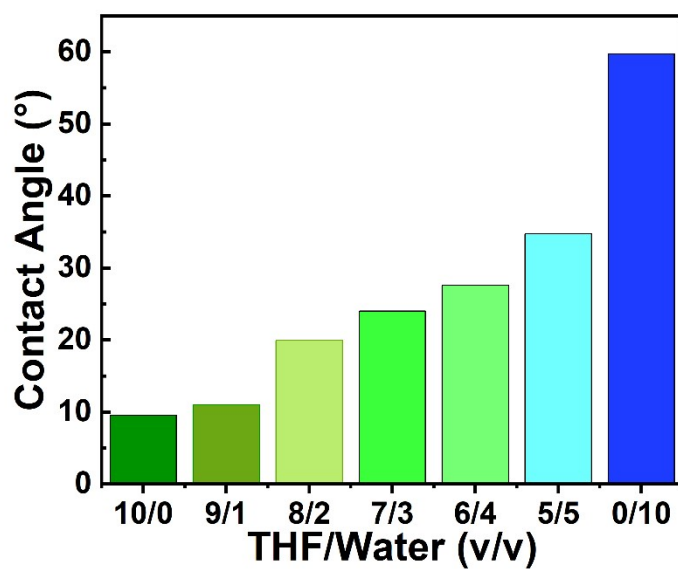


Fig. S4 Contact angle between cross-linked network structure and organic solutions.

Tab. S1 Comparisons of the properties and temperature curing procedures of bio-massed degradable epoxy systems reported in the literature and this work.

Composition	T <sub>d5</sub> (°C)	T <sub>g</sub> (°C)	Tensile strength (MPa)	Tensile modulus (GPa)	Reference
<b>DGEVX/DDS</b>	<b>315</b>	<b>240</b>	<b>82.00</b>	<b>4.06</b>	<b>This work</b>
DGEVE/DDS	290	184	63.3-79.3	3.35	1
DGEVP/IPDA	278	169	78-92	3.13	2, 3
DGHMDO/DDM	330	164	104.00	2.16	4
SAE-E	<300	72	15.00	0.45	5
AEp-2	292	147	67.40	1.88	6
ACA-III	303	62	48.00	1.47	7
ACE-III	309	189	66.00	1.72	8
BOB-DDS-2	<300	168.4	88.8	2.15	9
TDE-85/DTDA	282	212	70.7	1.61	10
TDS-V5	-	163	-	2.78	11
DPG-0.3	322	165	78	3.9	12
LAE-GLU	<300	133	93.5	2.16	13

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