Electronic Supplementary Material (ESI) for Green Chemistry.

Electronic supplementary information

# Fully atom-efficiency transformation of wasted polycarbonate into epoxy thermosets and the catalyst-free degradation of the thermosets for environmental sustainability

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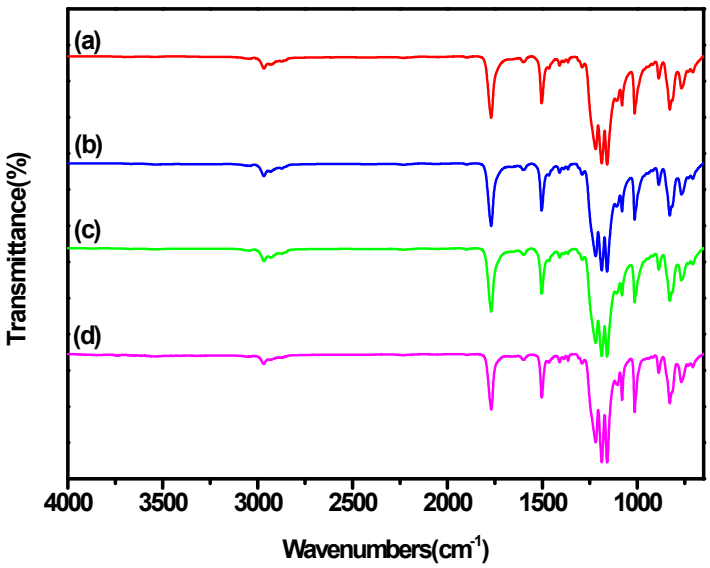



**Fig. S1.** IR spectra of (a) base-soaked CD-PC, (b) acid-soaked CD-PC, (c) sandpaper-grinded CD-PC, and (d) fresh PC.

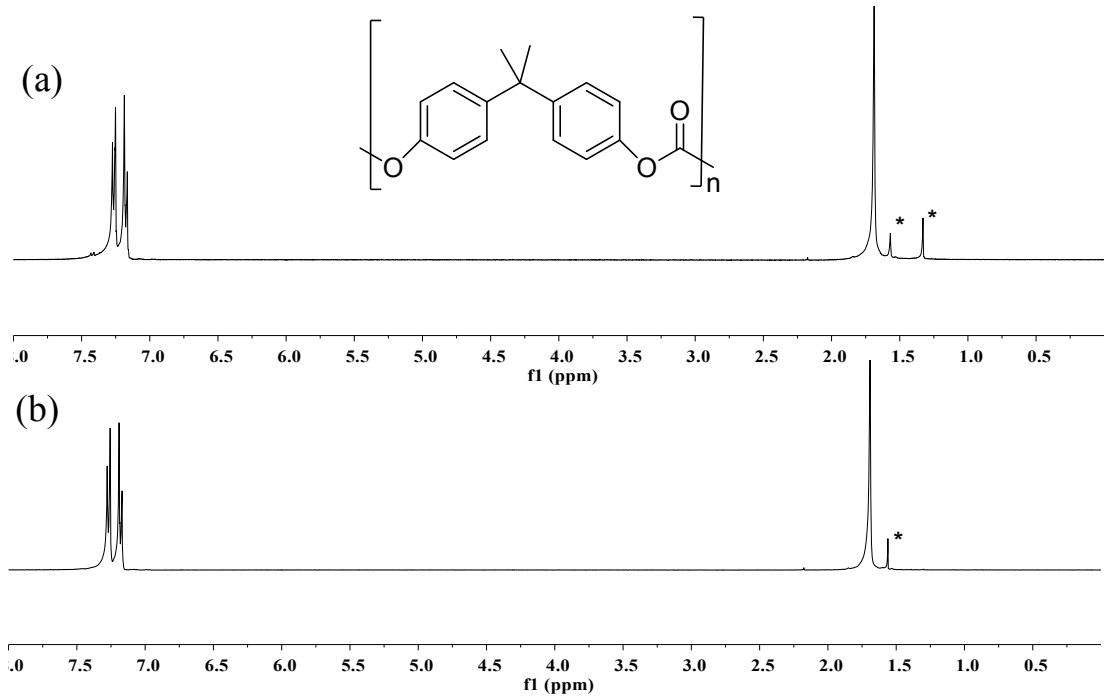



**Fig. S2.** $^{1}$H-NMR spectra of (a) based-soaked CD-PC and (b) fresh PC in d-chloroform

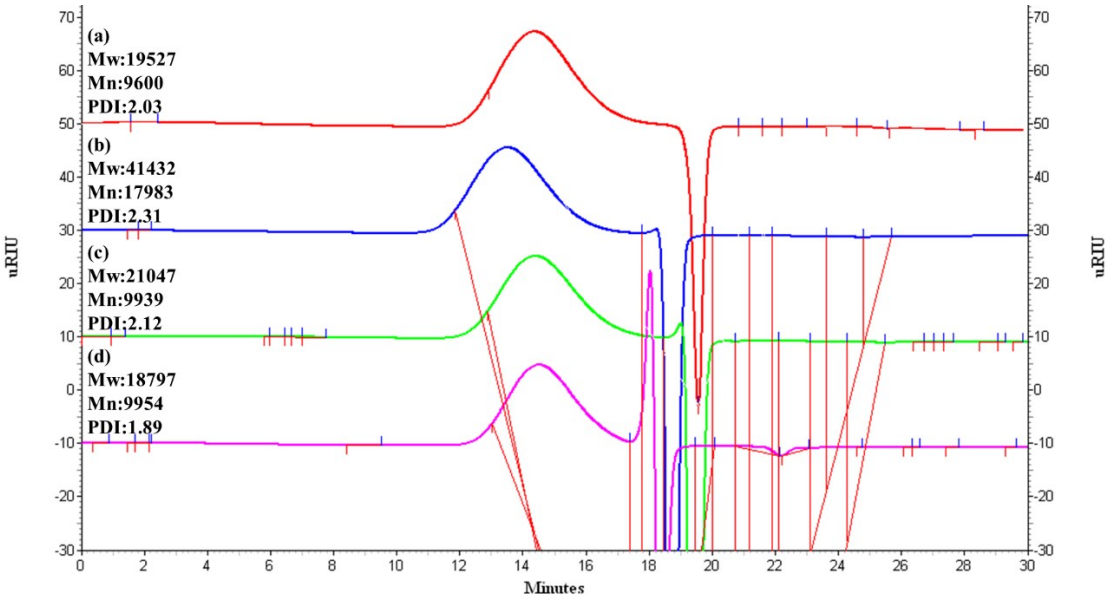



**Fig S3**. GPC curves of (a) base-soaked CD-PC, (b) acid-soaked CD-PC, (c) sandpaper-grinded CD-PC, and (d) fresh PC. NMP was used as the mobile phase.

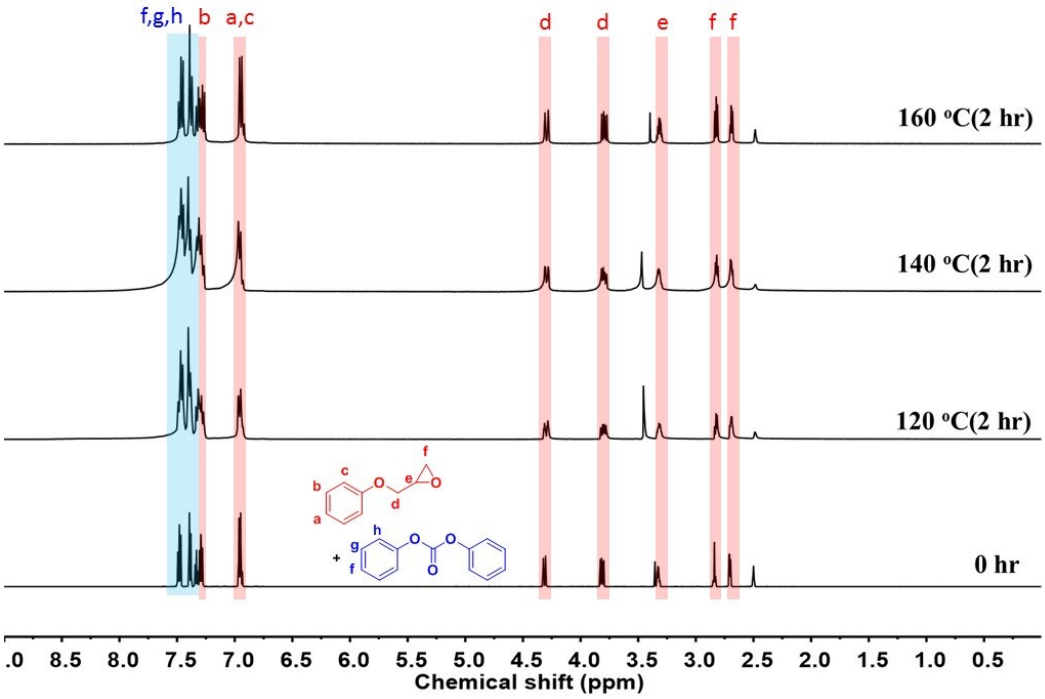



**Fig. S4.** [1]H-NMR spectra of the reaction product of DPC and GPE at different stages, including 120 °C for 2h, 140 °C for 2h, and 160 °C for 2h, respectively.

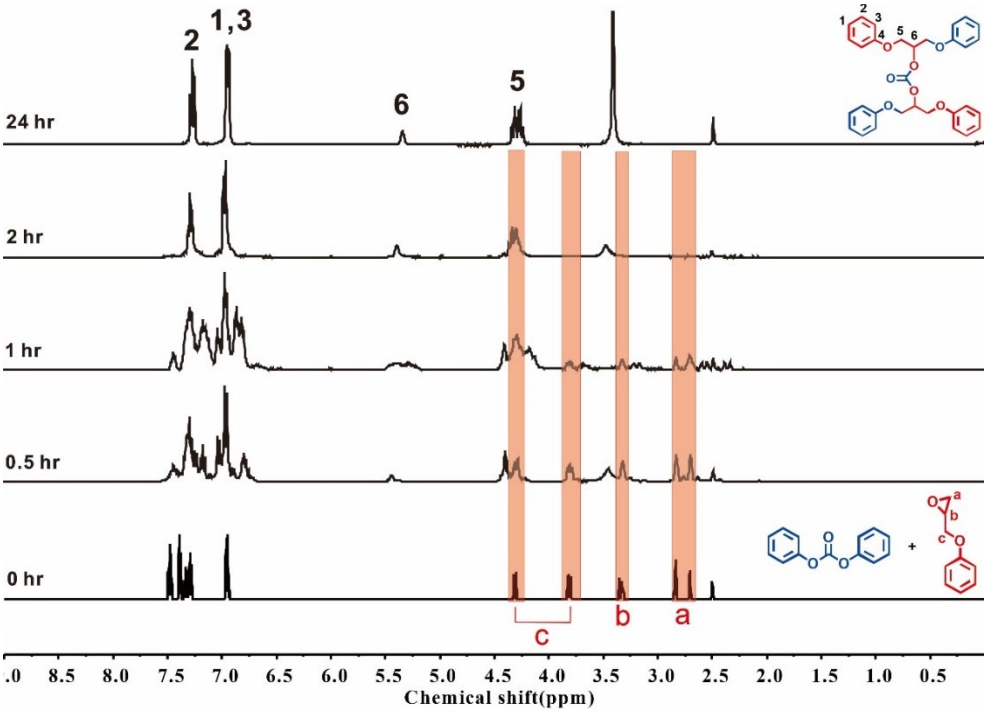



**Fig. S5.** [1]H-NMR spectra for the reaction of DPC and GPE after reacting at 120 °C for different periods of time.

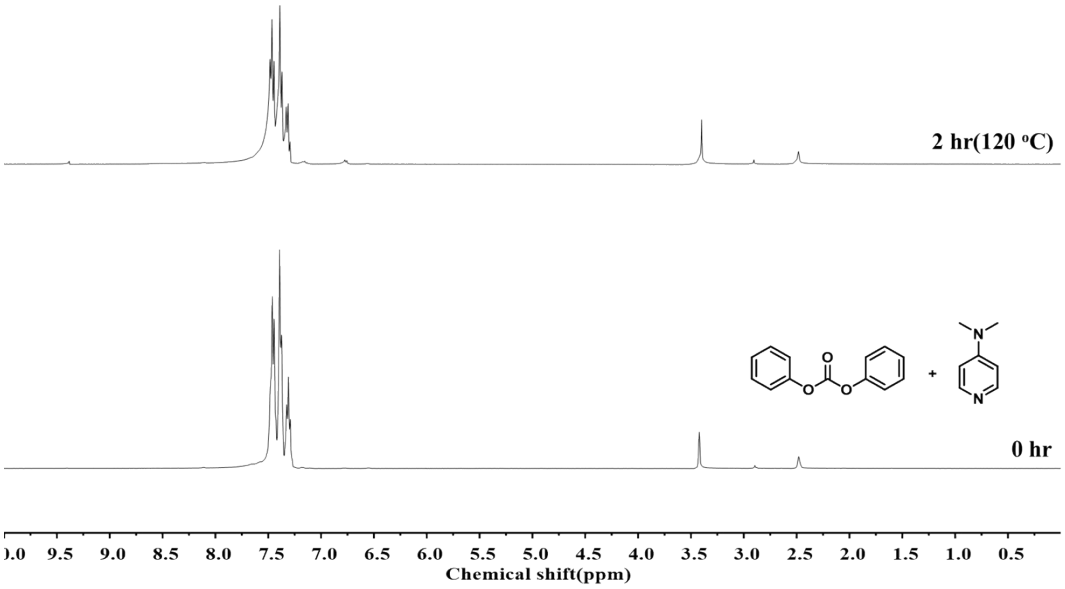



**Fig. S6.** $^{1}$H-NMR spectra of DPC with DMAP before and after stirring at 120 °C for 2h.

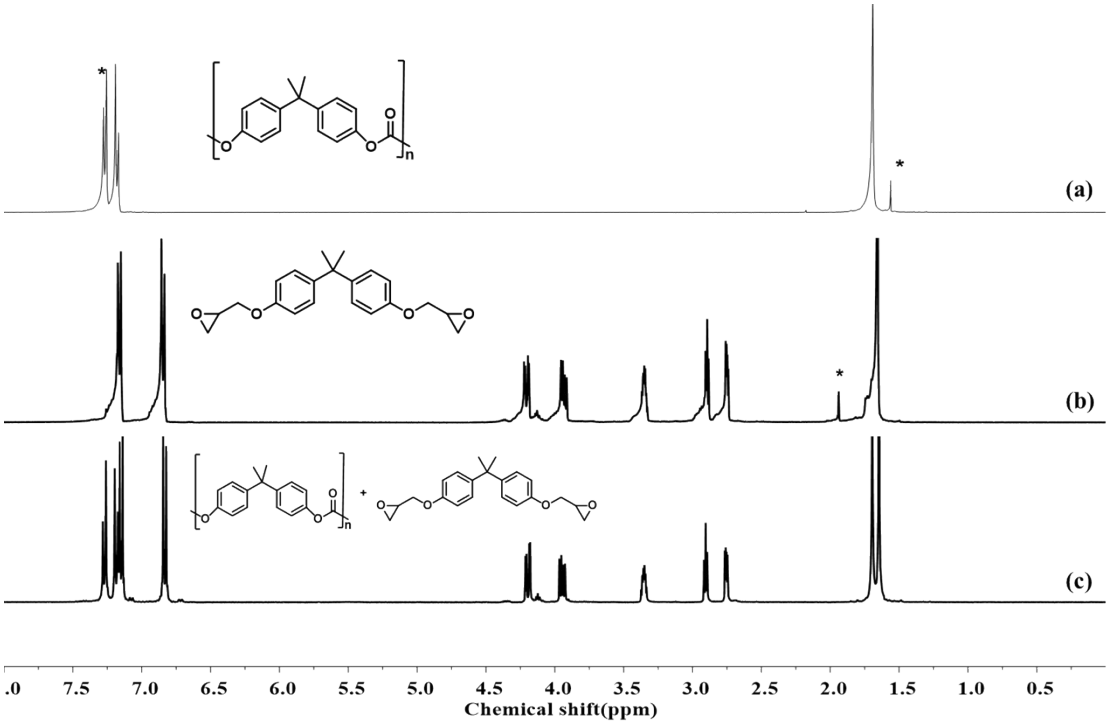



**Fig. S7.** $^{1}$H-NMR spectra of (a) WPC, (b) epoxy **I**, and (c) WPC/**I** blend (without DMAP) that has been stirred at 200 °C for 1h.

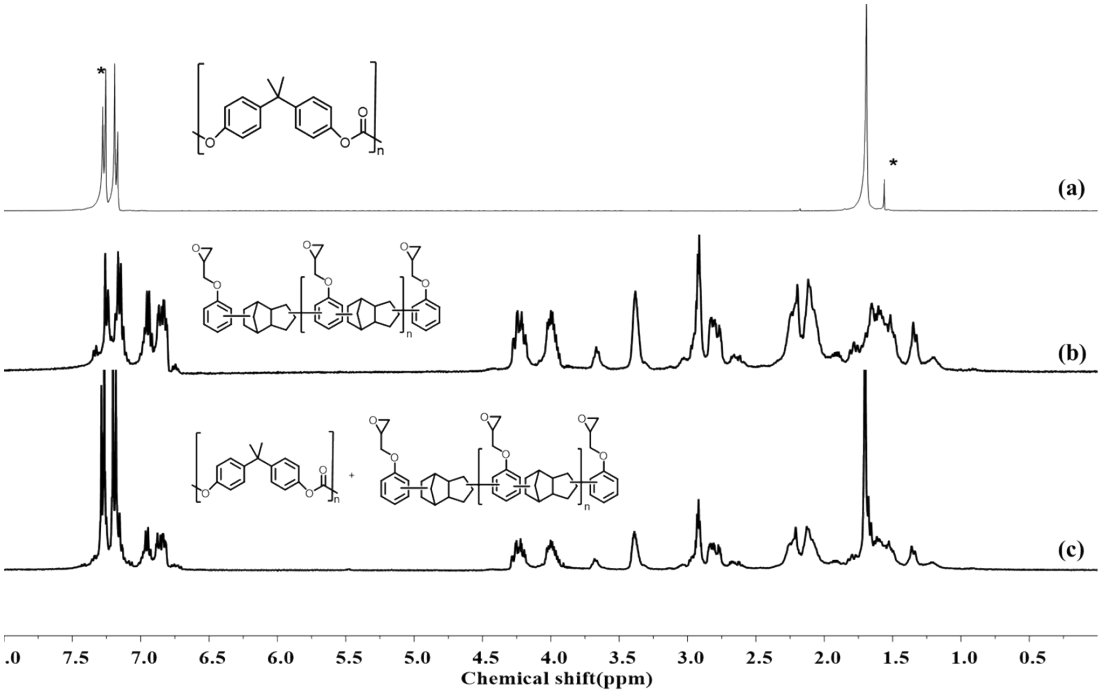



**Fig. S8.** [1]H-NMR spectra of (a) WPC, (b) epoxy **IV**, and (c) WPC/**IV** blend (without DMAP) that has been stirred at 200 °C for 1h.

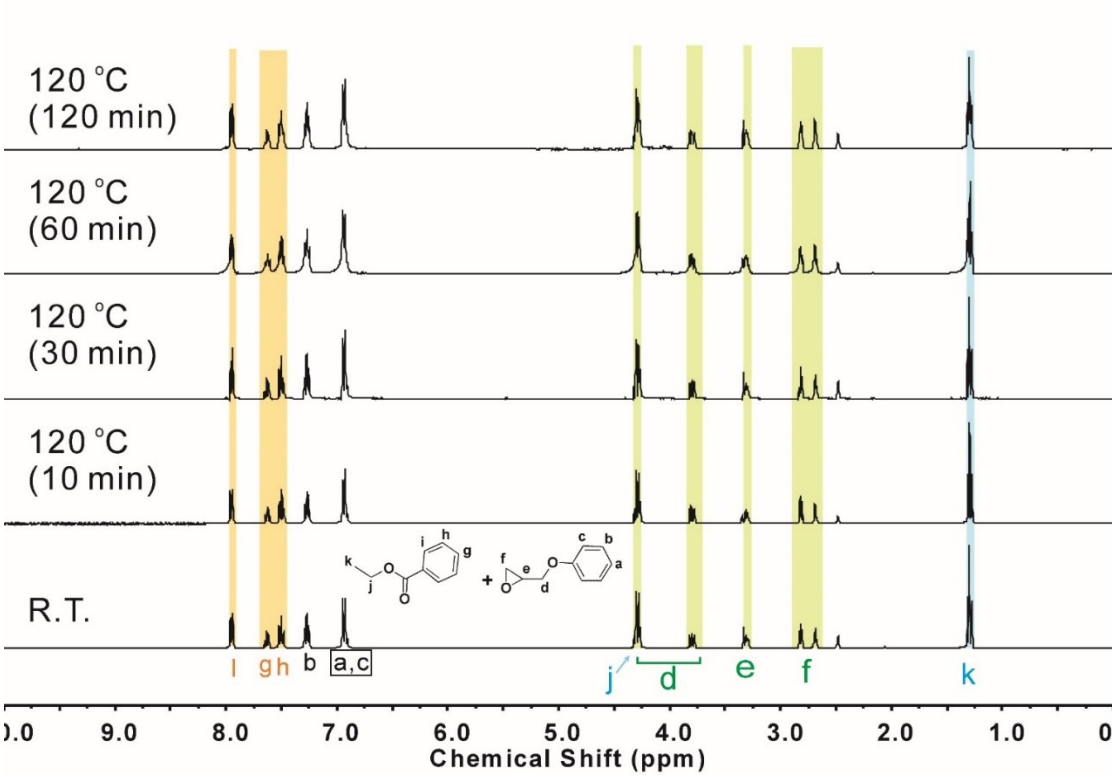



**Fig. S9.** [1]H-NMR spectra of the reaction product of ethyl benzoate and GPE with 0.5wt% of DMAP at 120 °C for different periods of time.

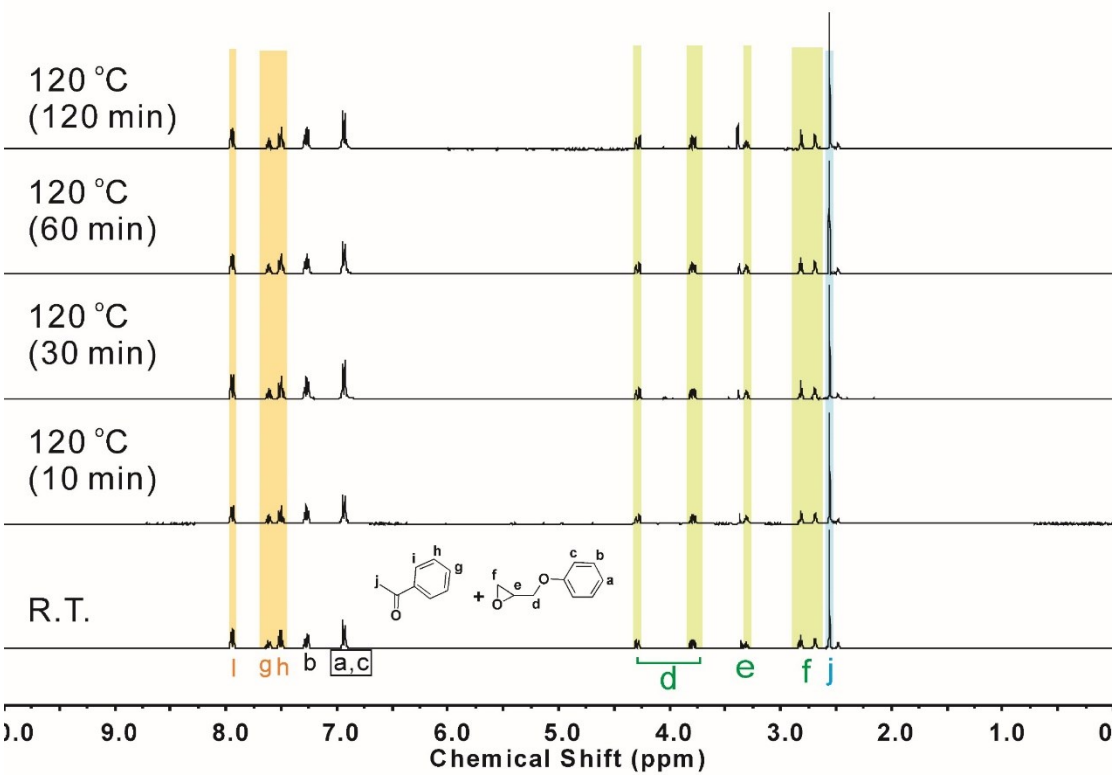



**Fig. S10.** $^{1}$H-NMR spectra of the reaction product of acetophenone and GPE with 0.5wt% of DMAP at 120 °C for different periods of time.

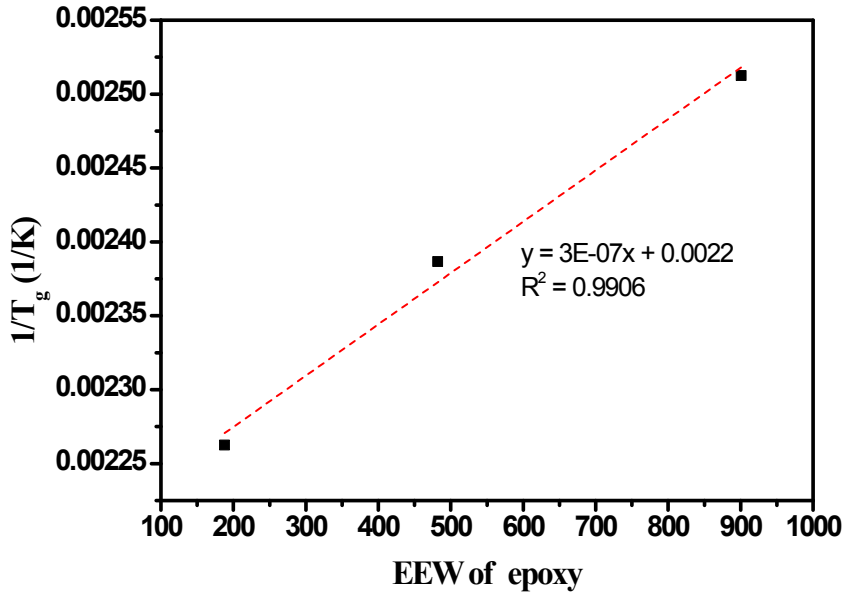
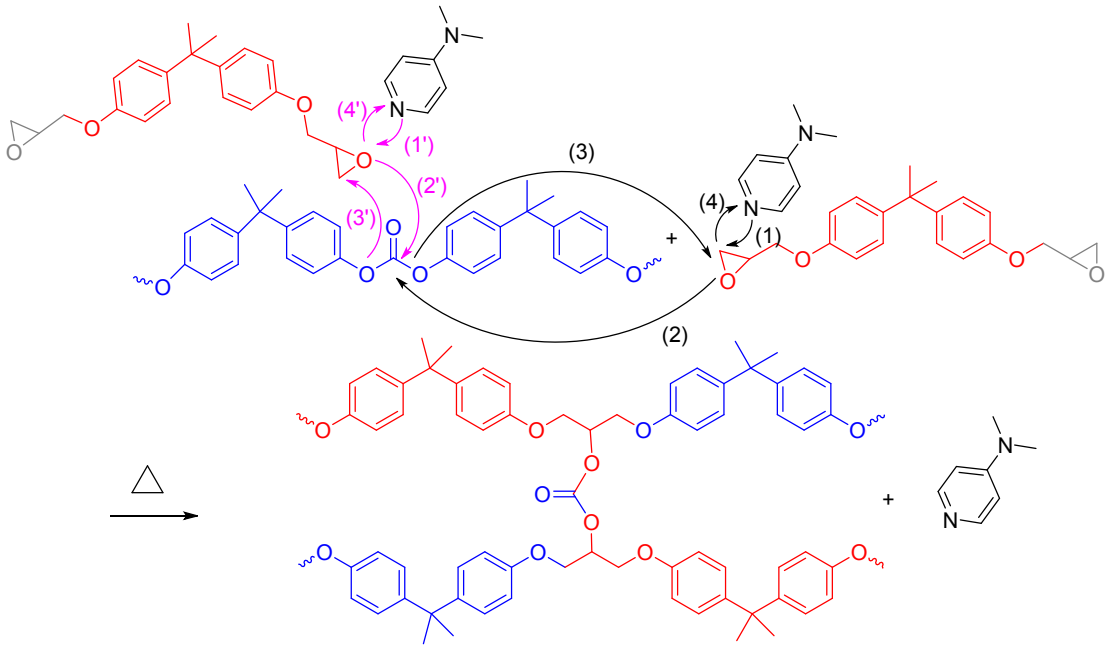



**Fig. S11.** The relation of $1/T_g$ and epoxy equivalent weight (EEW)




**Scheme S1.** The simplified curing chemistry of WPC and epoxy I.