Supplementary Information

Robust, malleable, degradable, self-healable, weldable and recyclable polyimine thermosets from natural peach gum and chitosan

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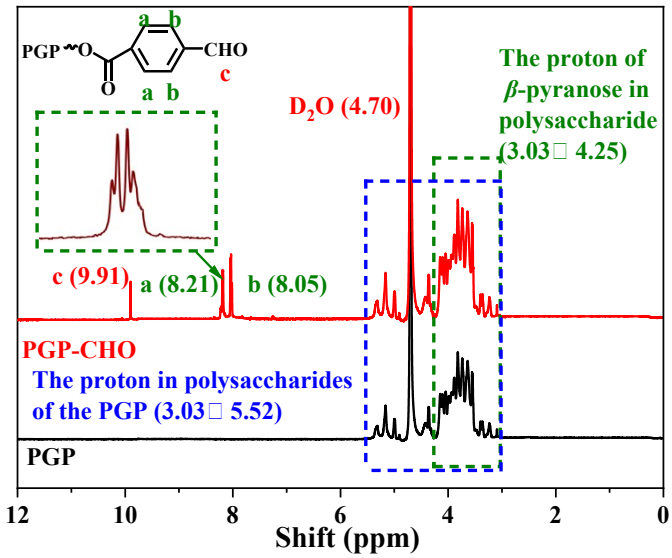


Fig.S1. ^{1}H NMR spectra of PGP-CHO and PGP.

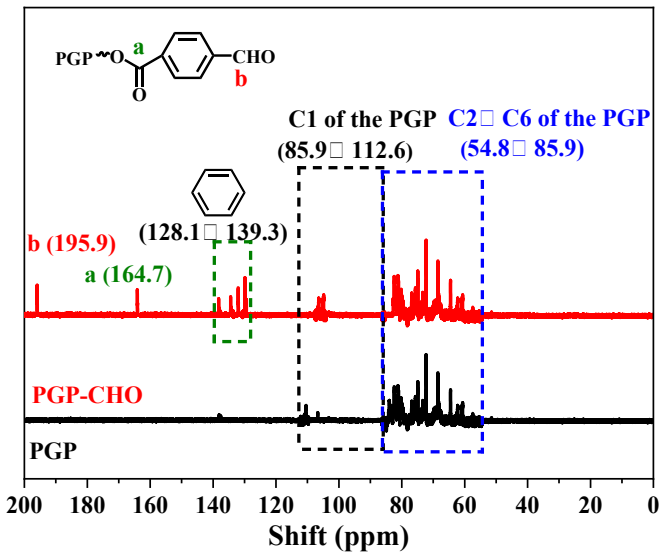


Fig.S2. ^{13}C NMR spectra of PGP-CHO and PGP.

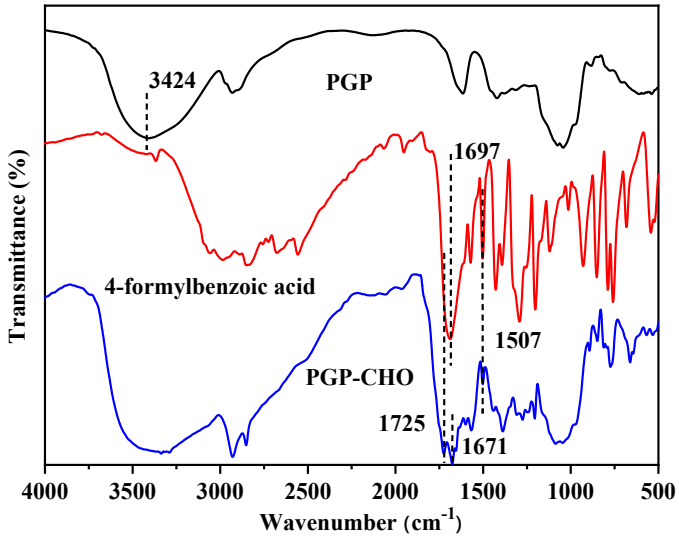


Fig. S3. FTIR spectra of PGP, 4-formylbenzoic acid and PGP-CHO.

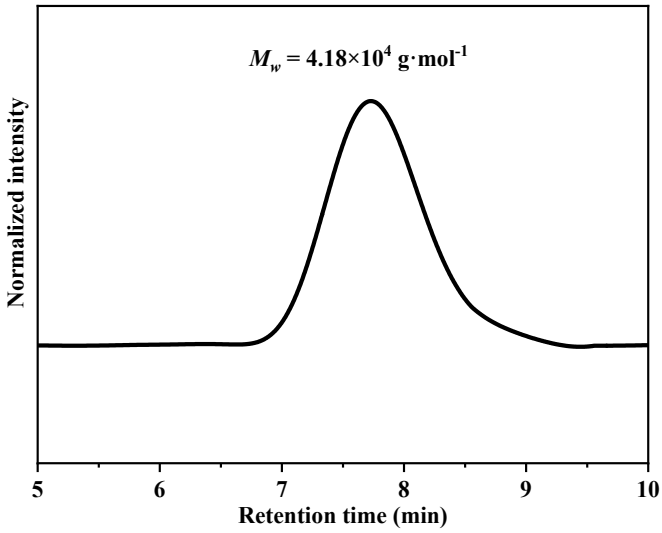


Fig. S4. GPC profile of the PGP-CHO.

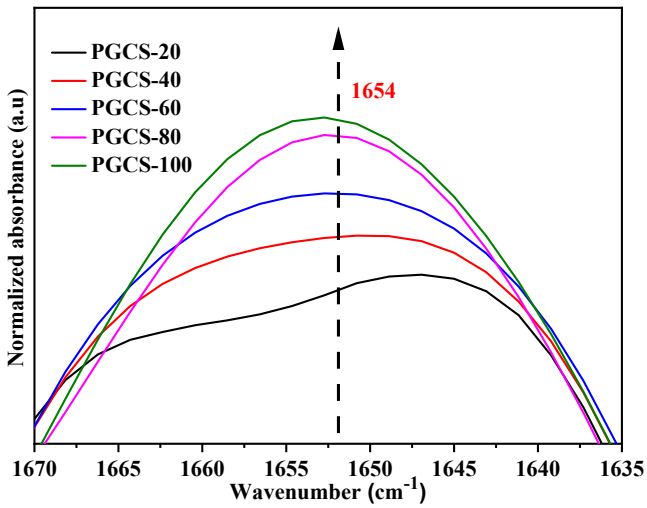


Fig. S5. Normalized FTIR spectra of PGCS-x at a range from 1670 to 1635 cm^{-1}.

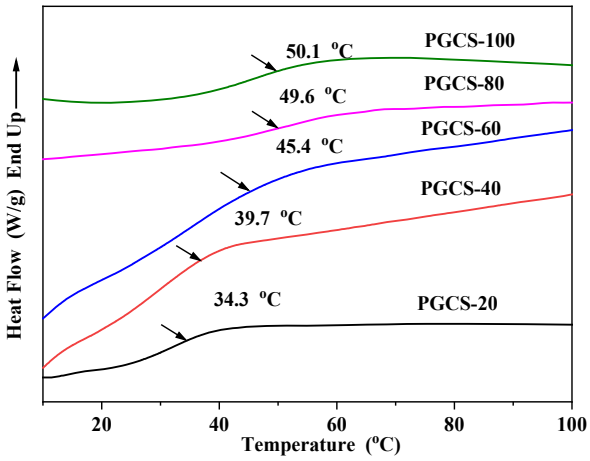
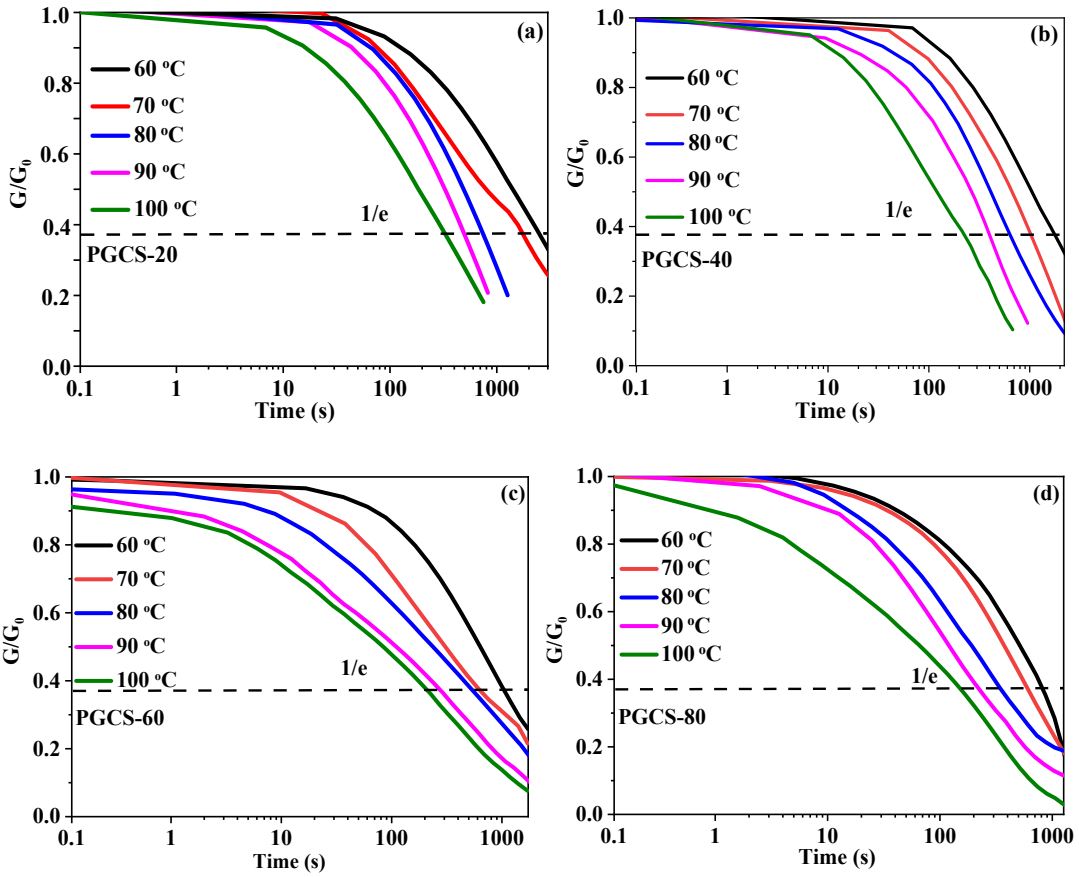


Fig. S6. DSC plots of PGCS-x



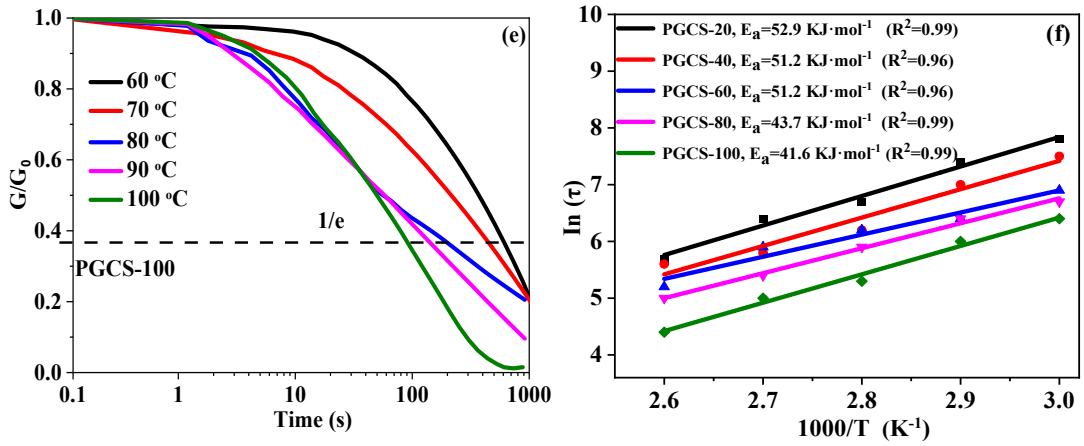


Fig. S7. (a) PGCS-20 at 60/70/80/90/100 °C; (b) PGCS-40 at 60/70/80/90/100 °C; (c) PGCS-60 at 60/70/80/90/100 °C; (d) PGCS-80 at 60/70/80/90/100 °C; (e) PGCS-100 at 60/70/80/90/100 °C; (f) Arrhenius fitting plot of PGCS-x.

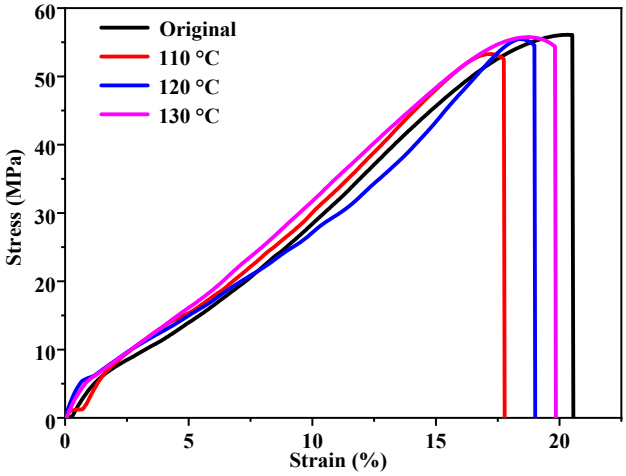


Fig. S8. Stress-strain curves of the PGCS-100 after self-healing for 60 min

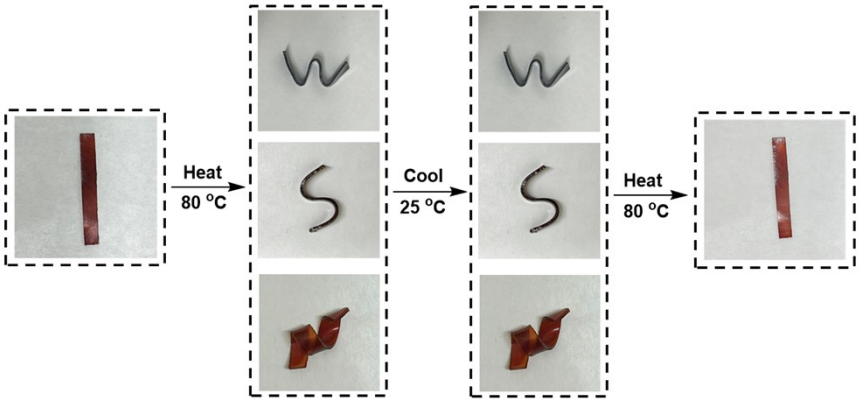


Fig. S9. Shape memory performances of PGCS-100

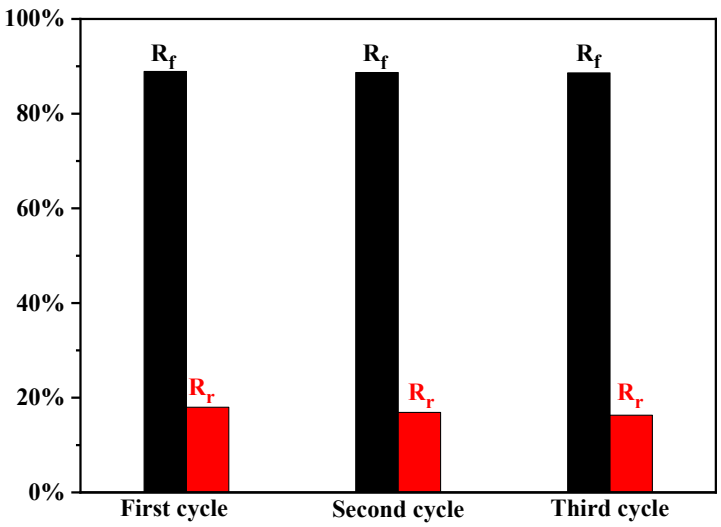


Fig. S10. R_f and R_r values over three shape memory cycles of PGCS-100

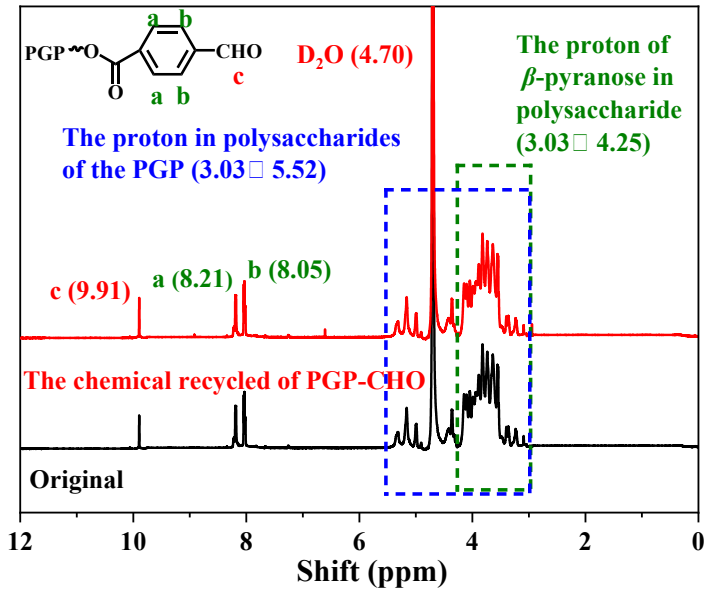


Fig. S11. ^{1}H NMR spectra of the recycled PGP-CHO.

Table S1 Comparison of thermal, mechanical and thermomechanical properties in this work and in literatures.

	Bio-based resources	Tensile strength (MPa)	Young's modulus (MPa)	T_g (°C)	E_a (KJ·mol^{-1})
This Work	Peach Gum / Chitosan	56.5	439	79.7	41.6
Ref 16	Fructose / Plant oil	0.69	4.4	-10	64
Ref 4	Vanillin / Castor oil	5.21	21.8	-7.5	–
Ref 18	Vanillin / Plant oil	1.04	–	-5.0	57.12
Ref 15	Lignin / Plant oil	2.77	117	110	–