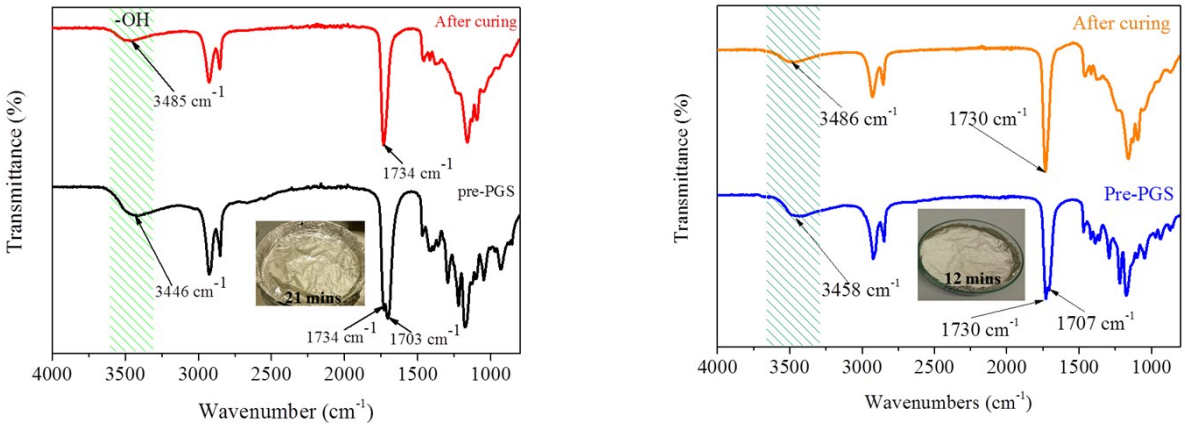
Electronic Supplementary Material (ESI) for Polymer Chemistry.

Supporting Information

Tailoring Degree of Esterification and Branching of Poly(glycerol sebacate) by Energy Efficient Microwave Irradiation

*Chi Ching Lau, Mustafa Kemal Bayazit, Jonathan Campbell Knowles and Junwang Tang**



(a) (b)

Figure S1: ATR-IR spectra of pre-PGS (DE~ 70%) and cured PGS prepared by (a) 21 minutes in multimode and (b) 12 minutes in single mode microwave and followed by 8 h curing.

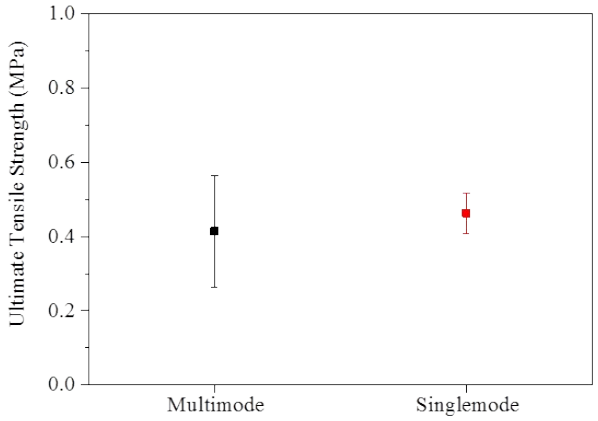


Figure S2: Ultimate Tensile Strength (MPa) of PGSs prepared by 21 minutes in multimode and 12 minutes in single mode microwave and followed by 8 h curing.

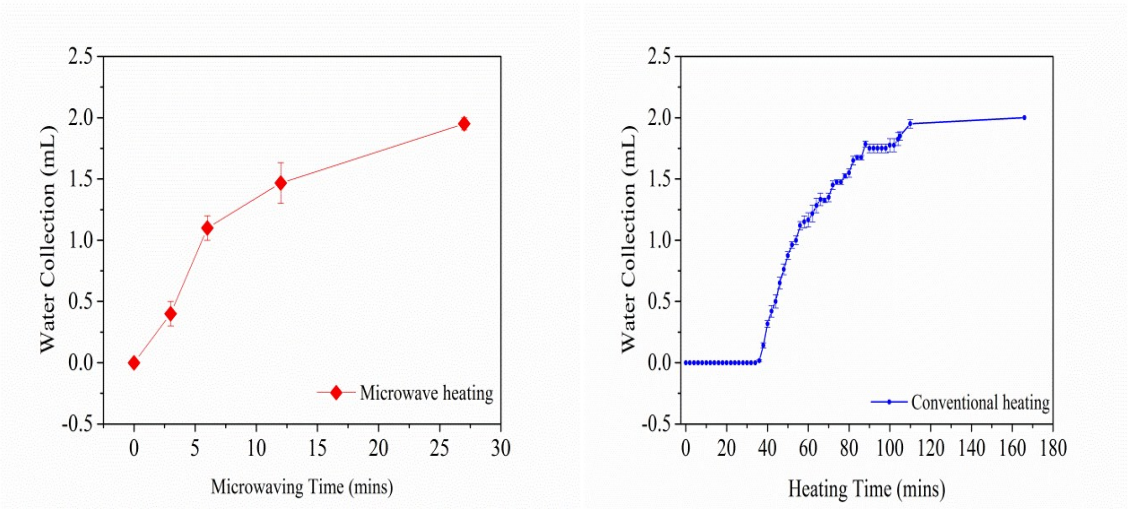


Figure S3: Water collection profile of polymerisation process via single mode microwave irradiation (MI) and conventional heating (CH) method.

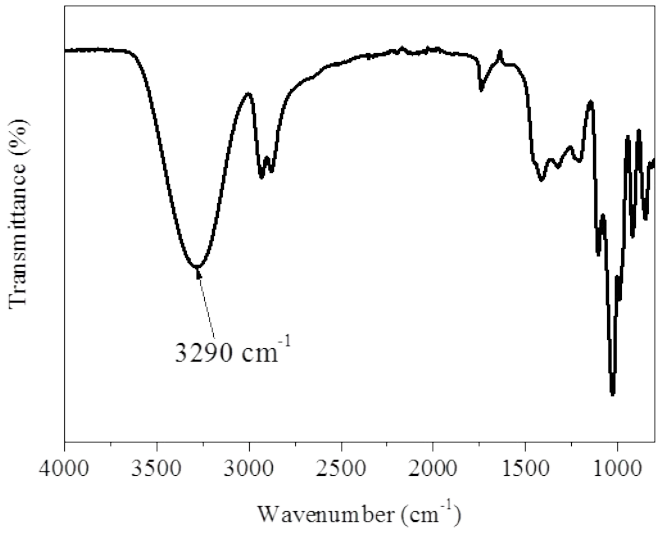


Figure S4: IR spectra of glycerol before prepolymerisation step.

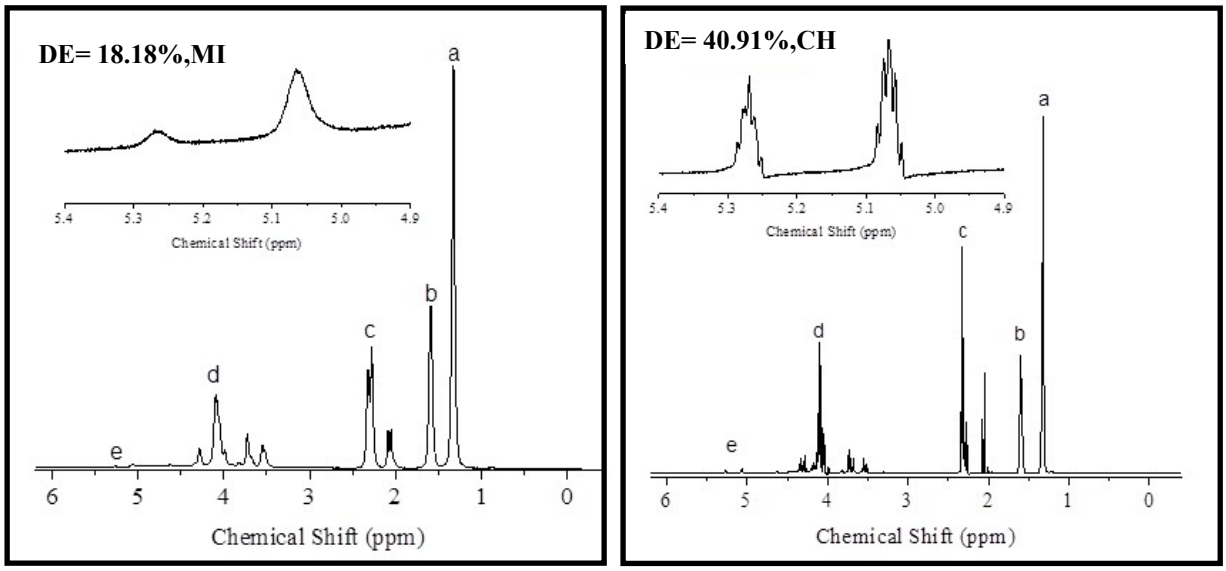


Figure S5: A full ^{1}HNMR spectra of the pre-PGS after heating for 3 (18.18% DE) and 50 (40.91%) minutes using single mode MI and CH, respectively.

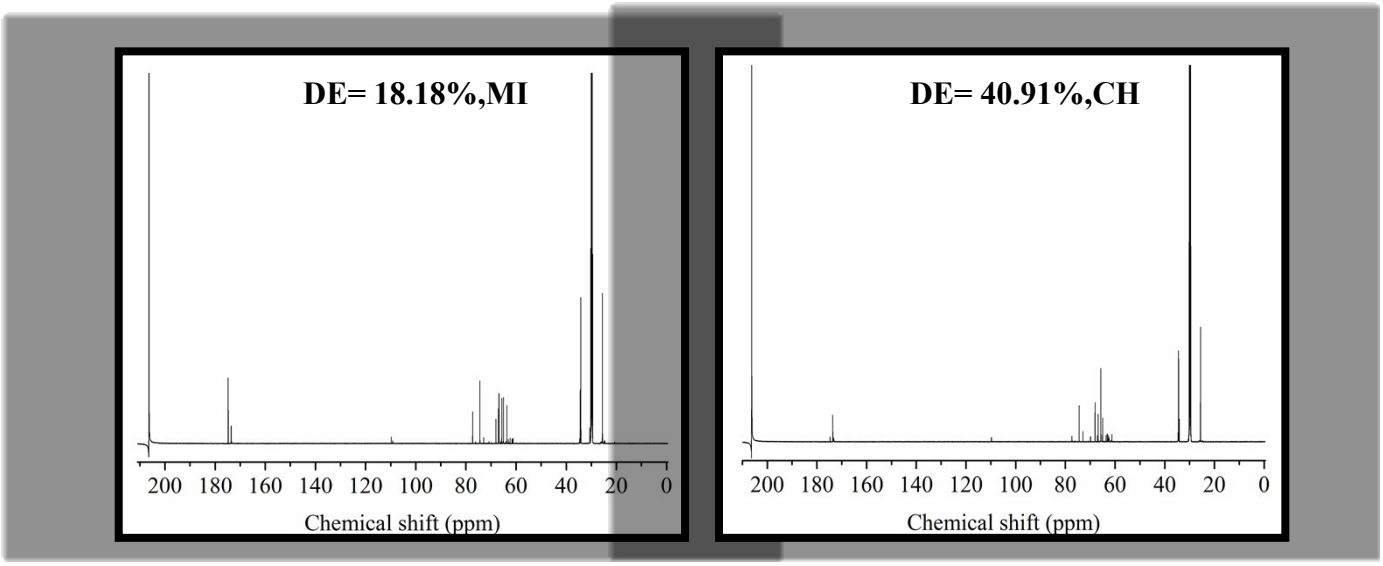


Figure S6: A full ^{13}CNMR spectra of the pre-PGS that polymerised after 3 minutes (18.18% DE) and 50 minutes (40.91% DE) of single mode MI and CH, respectively. The peak at 206.2 ppm is due to deuterated acetone solvent.

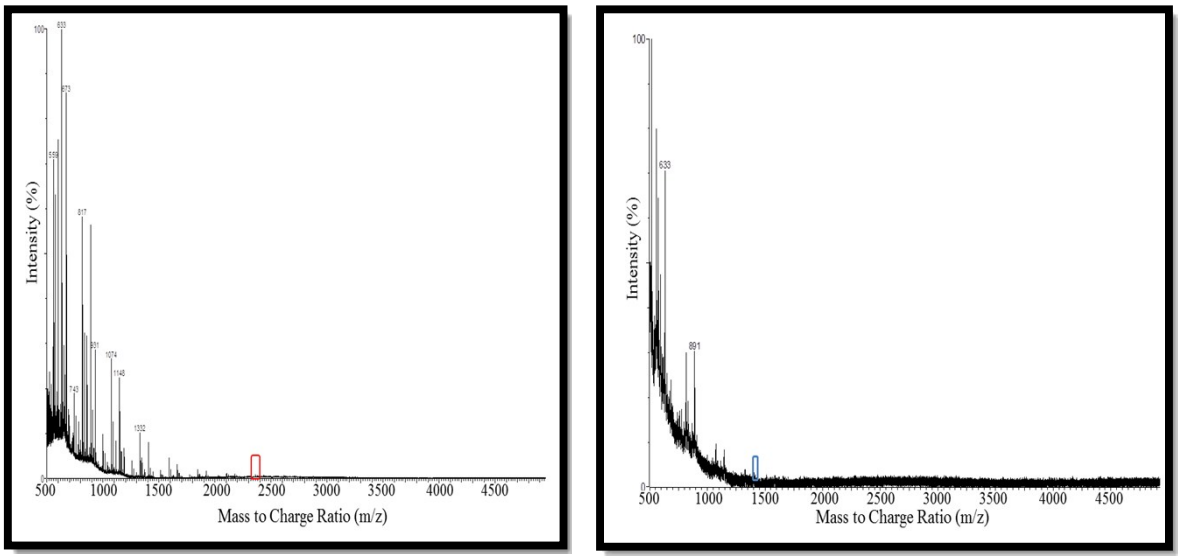


Figure S7: MALDI-TOF spectrum of pre-PGS at (a) 18.18% DE by single mode MI method and (b) 68.18% DE by CH method, with the region of 500-4800 m/z. The circled region is expanded in main text.

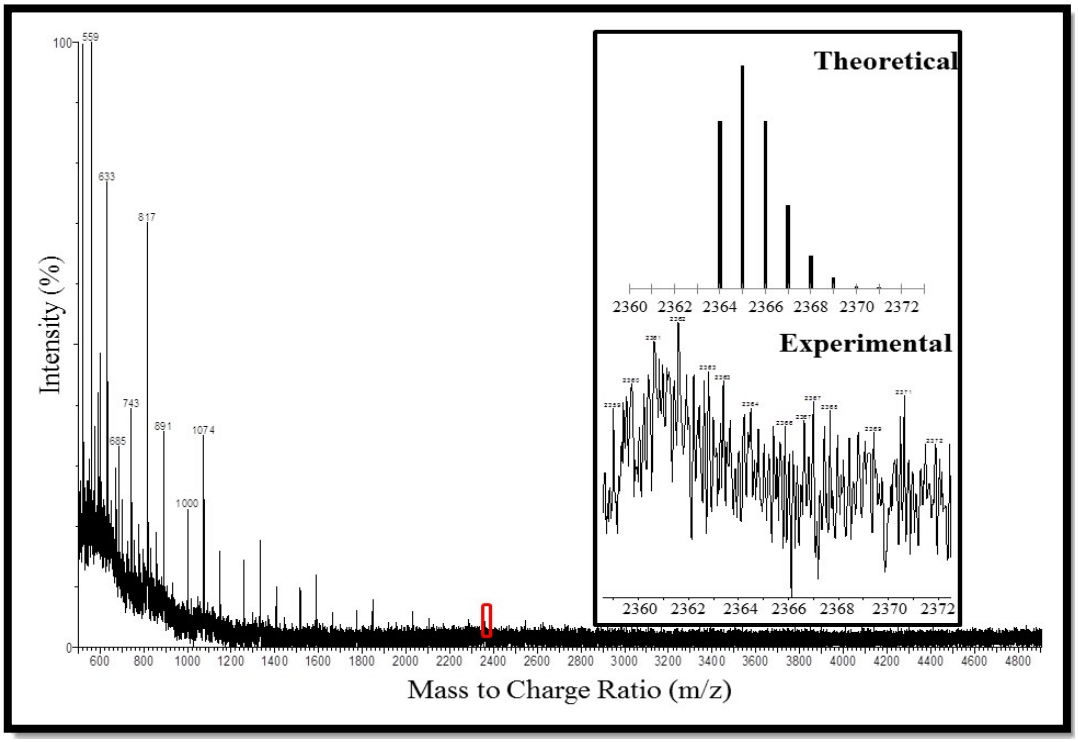


Figure S8: MALDI-TOF spectrum of pre-PGS at 66.82% of DE by single mode MI method, with the region of 500-4800 m/z. Inserted image shows the comparison between theoretical and experimental mass spectrum.

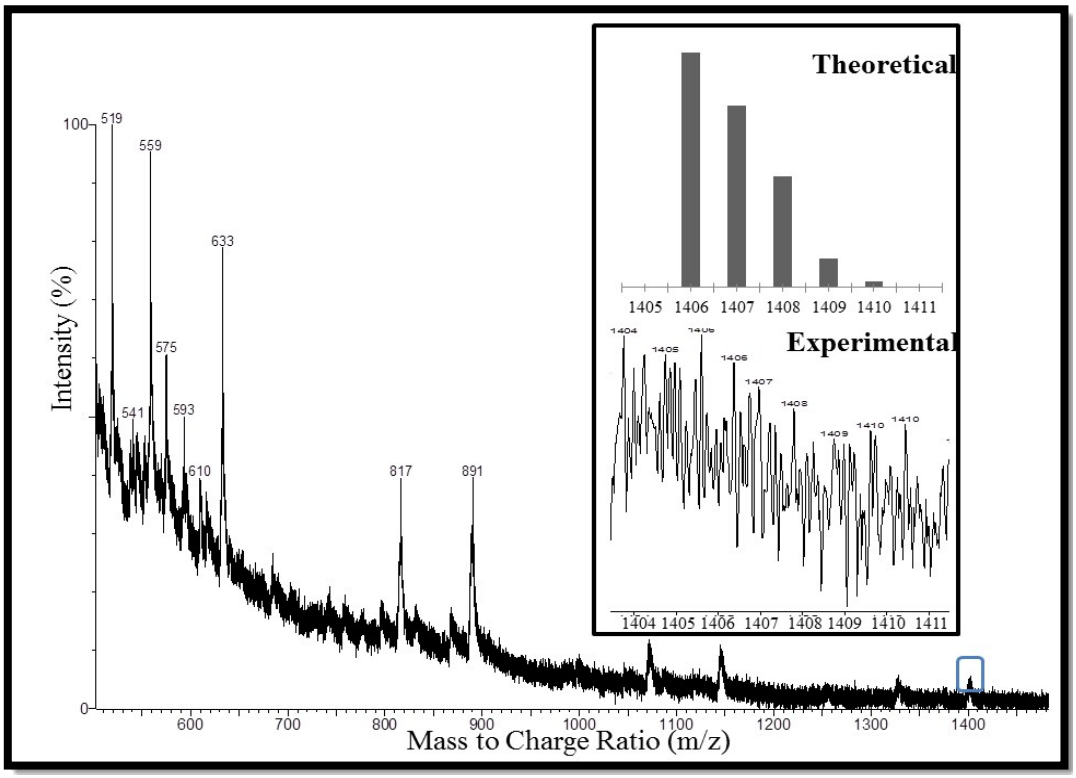


Figure S9: MALDI-TOF spectrum of pre-PGS at 40.91% of DE by CH method, with the region of 500-1500 m/z. Inserted image shows the comparison between theoretical and experimental mass spectrum.

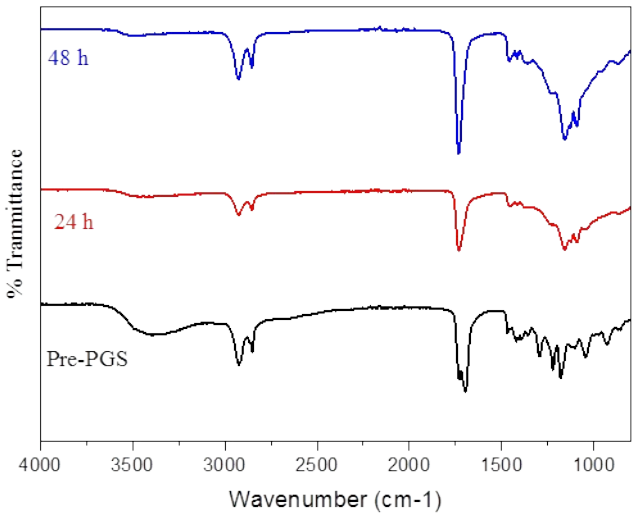


Figure S10: ATR-FTIR spectra of prepolymer and crosslinked PGS after 3 minutes of microwaving and then followed by 24-48 h of curing.

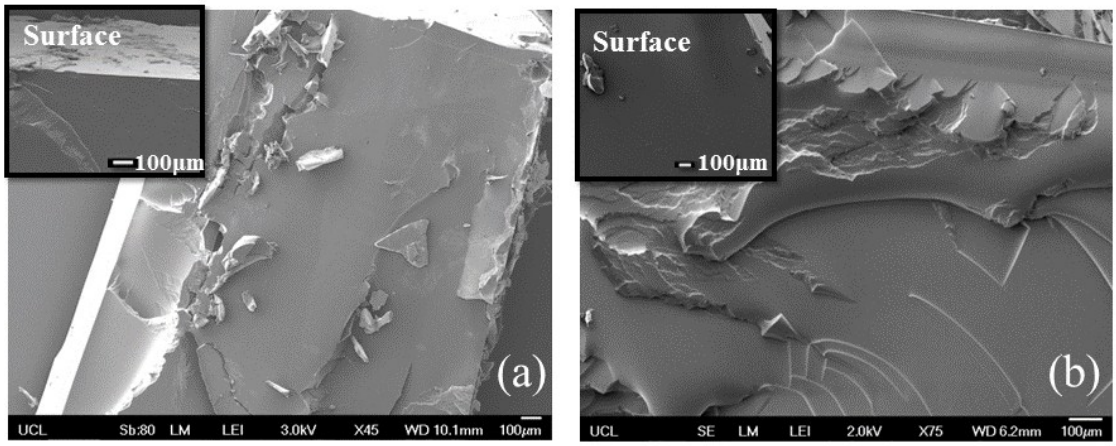


Figure S11. Cross section and surface (inserted) morphology of crosslinked PGS specimens where (a) 66.82%-MI, (b) 68.18%-CH after 24h curing in vacuum oven. These crosslinked specimens show similar morphology in microwave irradiation and conventional heating methods.

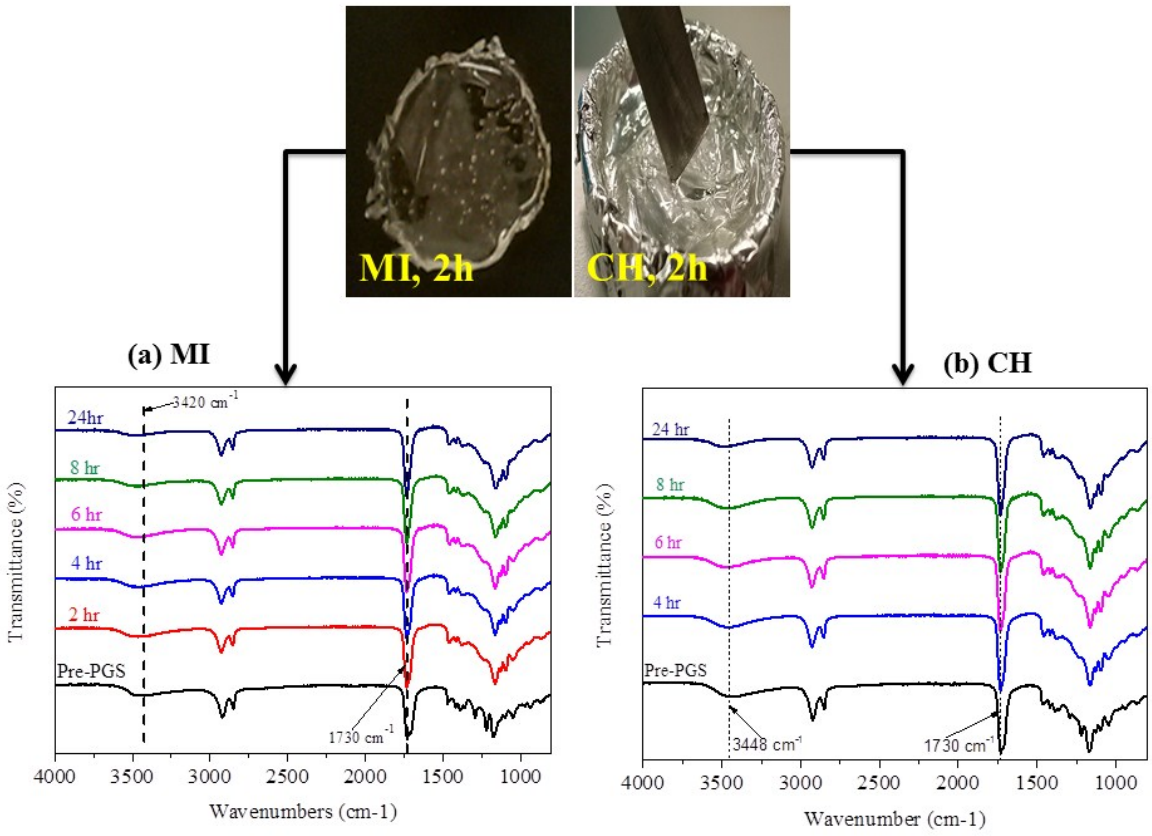


Figure S12: ATR-FTIR spectra of PGS (ca. 70% DE) that prepared by (a) single mode MI and (b) CH method before and after curing in the vacuum oven for 2-24 h.

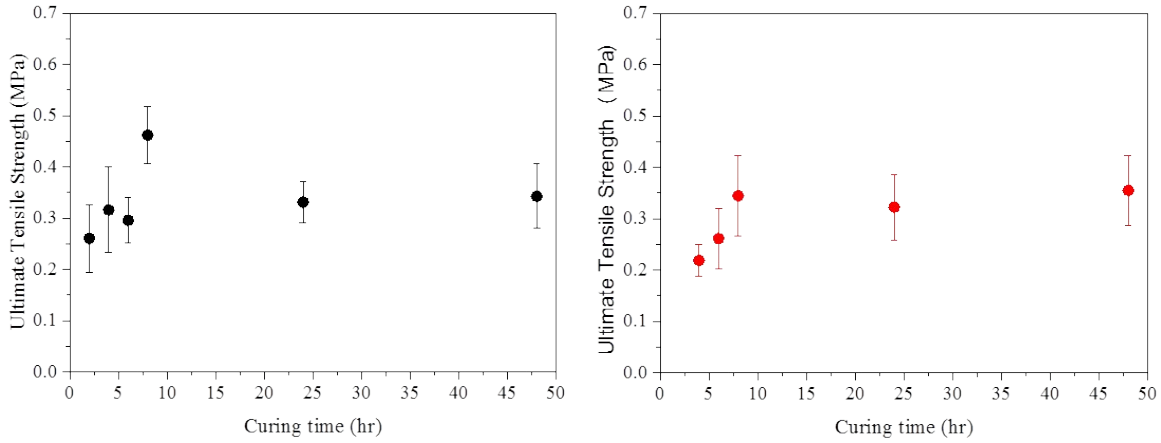


Figure S13: Ultimate tensile strength of PGS (ca. 70% DE) prepared by single mode MI (left) and CH (right) followed by different curing period (2-24 h).

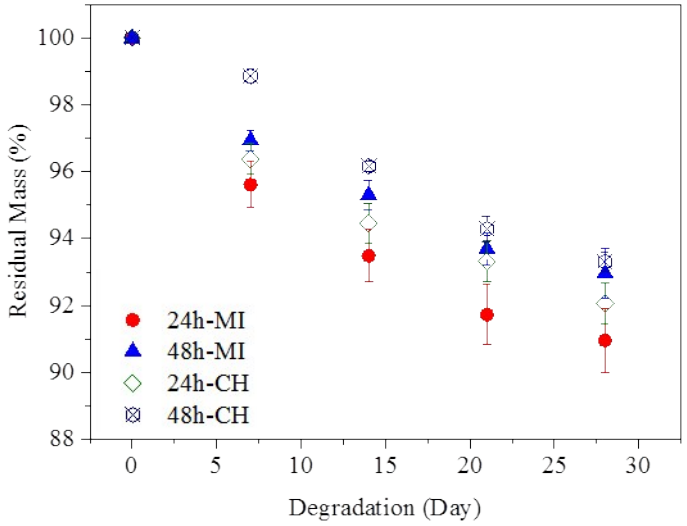


Figure S14: Degradation profile of PGS (ca. 70% DE) prepared by single mode MI and CH after 24-48 h curing process.