

Supporting Information

Osteoinductivity of PGS/HAp microporous composite scaffold obtained in the TIPS-TCL-SL method: an innovation for bone tissue engineering

1. Experimental section

NMR data

Molar fraction of an unreacted glycerol was calculated according to the following equation (**equation S1**):

$$x_{UG} = \frac{I_{3.44-3.84ppm} - [2I_{(5)} + 4I_{(4)} + 2I_{(2)}]}{5} \text{ (Equation S1)}$$

where $I_{3.44-3.84ppm} = I_{(4'')} + I_{(5')} + I_{(2'')} + I_{(UG)}$ is the area under the signal in the range from 3.44 to 3.84 ppm; $I_{(5)}$ is the integral of the signal related to the methine proton in the terminal T2 glycidic unit, $I_{(4)}$ is the integral of the signal related to the methine proton in the terminal T1 glycidic unit and $I_{(2)}$ is the integral of the signal related to the methine proton in L12 diglycidic subunit.

The molar fraction of the L13 glycidic unit was determined according to the following equation (**equation S2**):

$$x_{L13} = 1 - [x_{L12} + x_D + x_{T1} + x_{T2} + x_{UG}] \text{ (Equation S2)}$$

where x_i is the molar fraction of the glycidic unit type^[1].

Carboxylic acid conversion (p_{COOH}) was estimated by Lorentzian fitting of the overlapped signal a to derive the relative areas of component signals a' and a'' , related to the monoester- and diester type of sebacate subunit. Then the conversion of carboxyl groups was calculated according to the following equation (**equation S3**):

$$p_{COOH} = \frac{I_{a''}}{I_{a'} + I_{a''}} \text{ (Equation S3)}$$

where $I_{a'}$ and $I_{a''}$ are the integrals of the monoester- and diester-type of sebacate unit, respectively. The degree of substitution (DS), hydroxyl conversion (p_{OH}), number average degree of polymerization (DP) and degree of branching (DB) were calculated according to the methodology reported elsewhere^[1,2]. All of the parameters describing pPGS prepolymer derived from 1H NMR spectrum are presented in **Table S1**

Water contact angle measurement

Water contact angle measurements were conducted with a PG-X contact angle goniometer (Testing Machines, Inc.). Nine measurements were carried out for each specimen. The mean value was calculated as the standard deviation.

2. Results

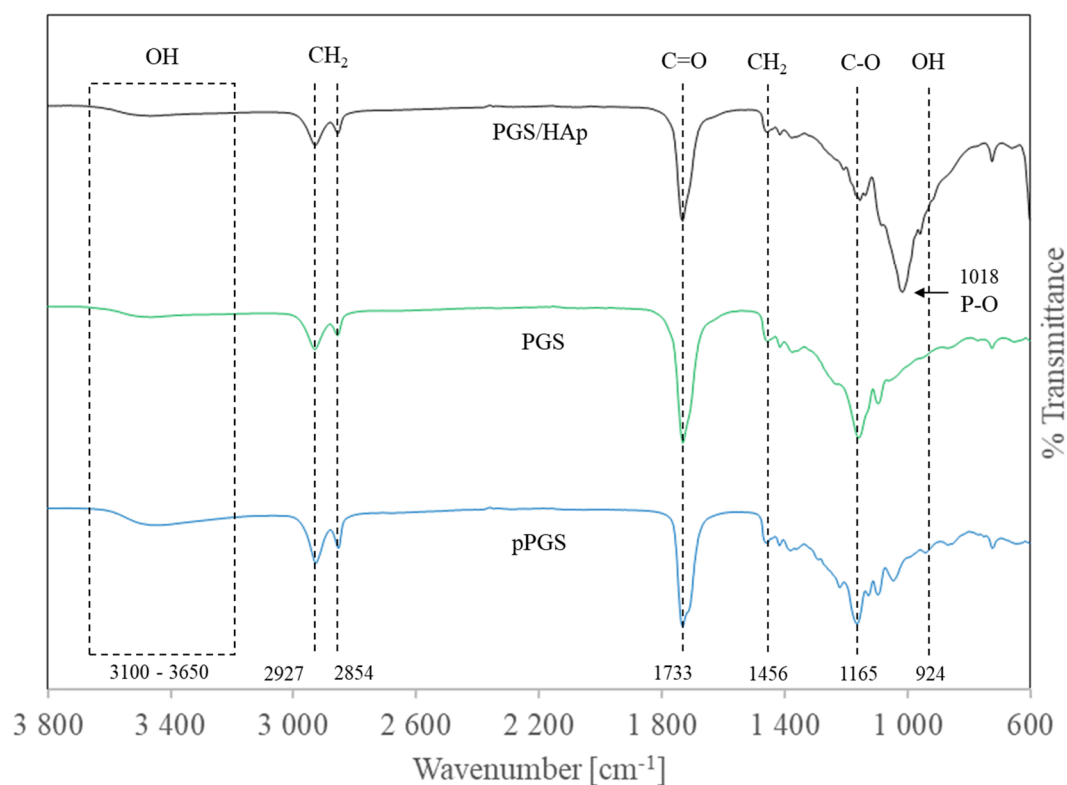


Figure S1. ATR-FTIR spectra of pPGS, PGS and PGS/HAp

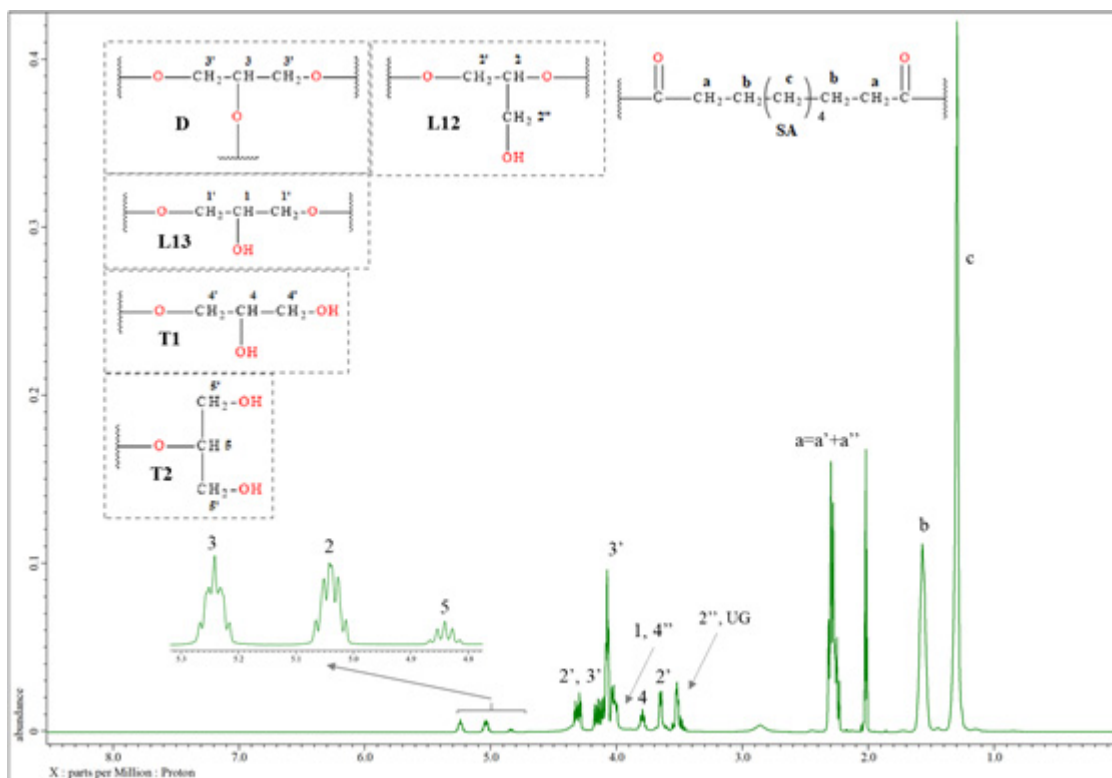


Figure S2. ^1H NMR spectrum in $(\text{CD}_3)_2\text{CO}$ of pPGS prepolymer with signals assignment (T1, T2 – terminal glyceridic units, L12, L13 – diglyceridic unit, D – triglyceridic unit, UG – unreacted glycerol, SA – sebacate subunit)

Table S1. Pre-polymer parametrs determined by ^1H NMR (x_i – average molar fraction of different types of glyceridic units in reaction medium, p_{COOH} – carboxylic acid conversion, p_{OH} – hydroxyl groups conversion, DP – average degree of polymerization, DS – degree of substitution, DB – degree of branching)

x_{UG}	x_{T1}	x_{T2}	$x_{\text{DG1,2}}$	$x_{\text{DG1,3}}$	$x_{\text{TG1,2,3}}$	p_{OH}	p_{COOH}	DP	DB	DS
0.03	0.24	0.03	0.16	0.38	0.16	0.63	0.91	10.2	0.37	1.89

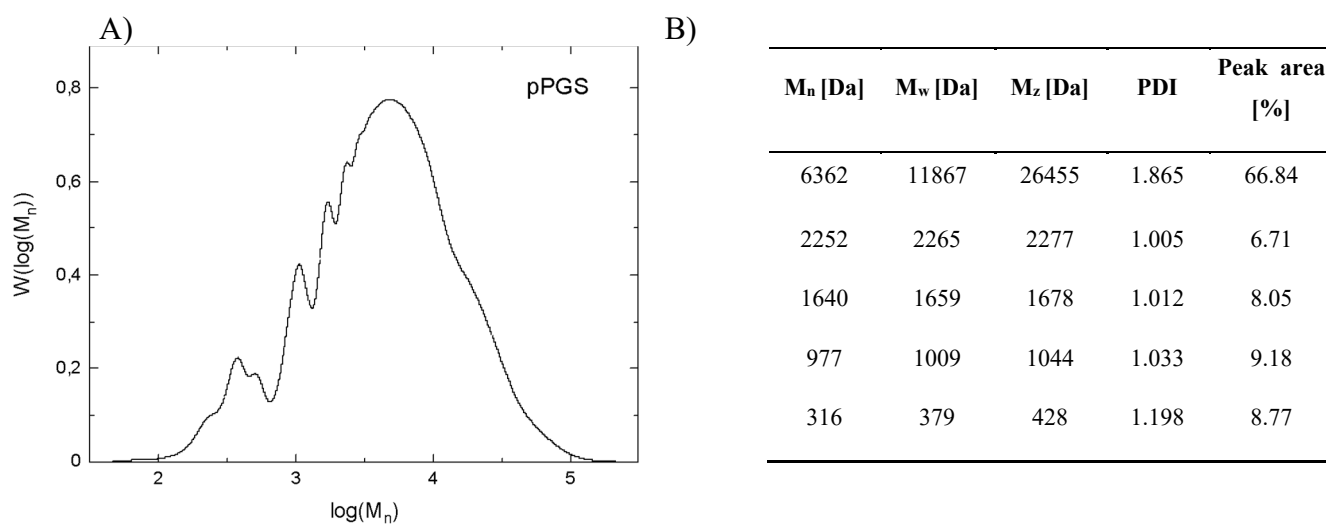


Figure S3. A) molecular weight distribution plot for pPGS, B) molecular weight distribution characterization

References

- [1] G. B. Perin, M. I. Felisberti, *Macromolecules* **2020**, *53*, 7925.
- [2] C. Moorhoff, Y. Li, W. D. Cook, C. Braybrook, Q.-Z. Chen, *Polym. Int.* **2015**, *64*, 668.