Supplementary Material

Preparation of Biodegradable Polypropylene Carbonate-Polylactic Acid Core Yarn by Electrospinning and Its Antibacterial Finishing

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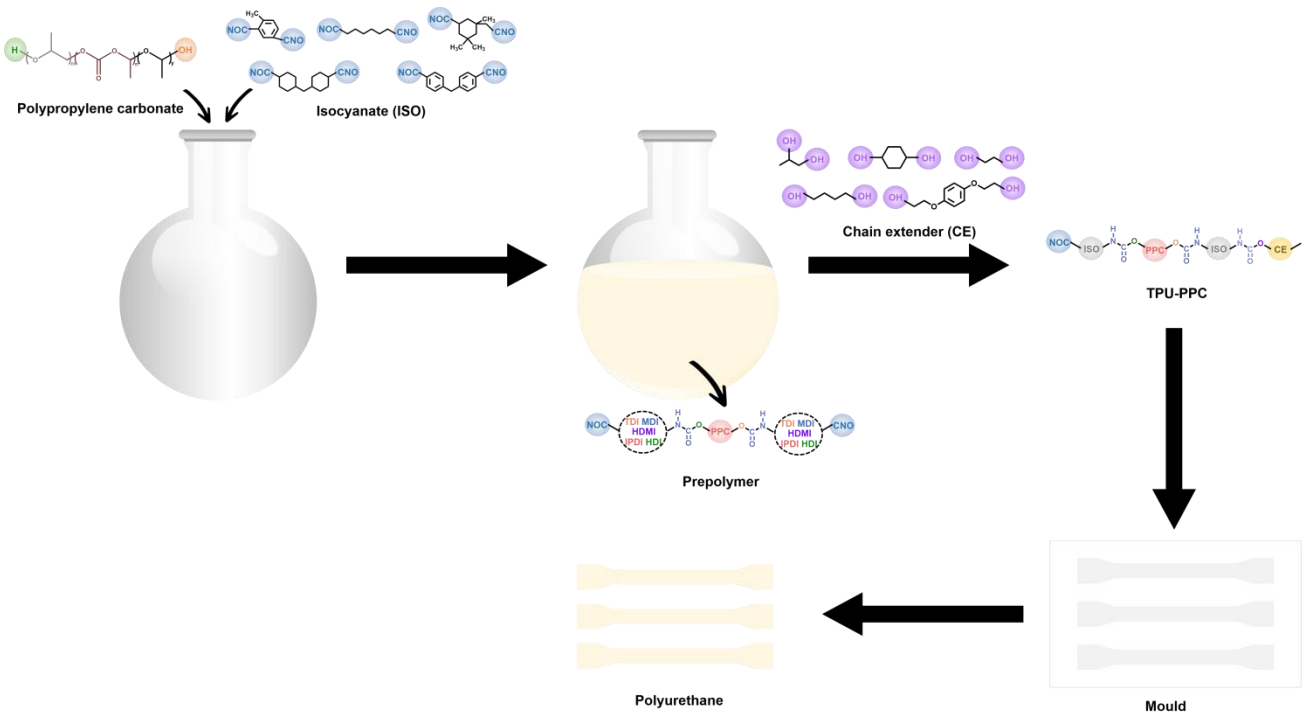
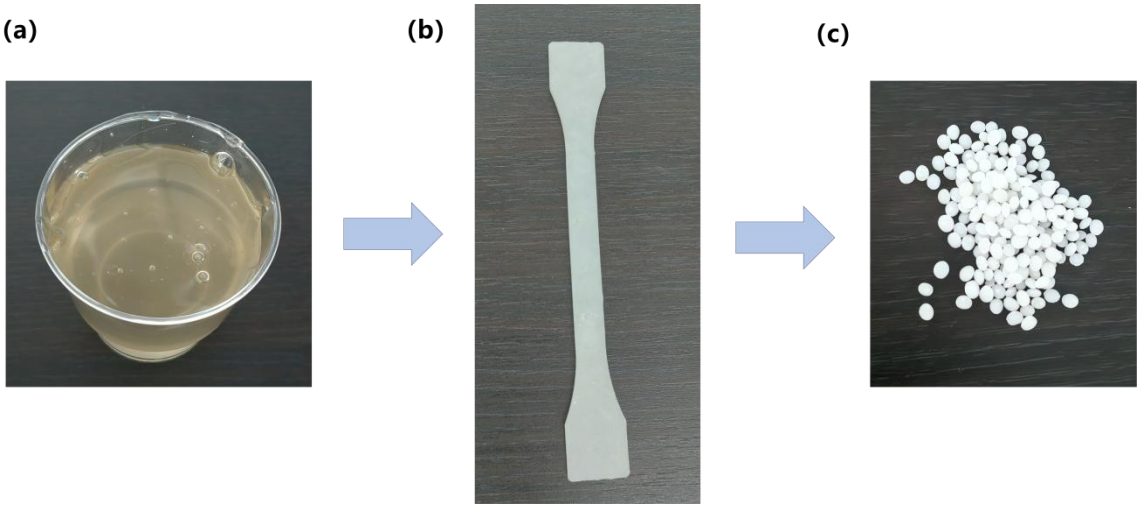
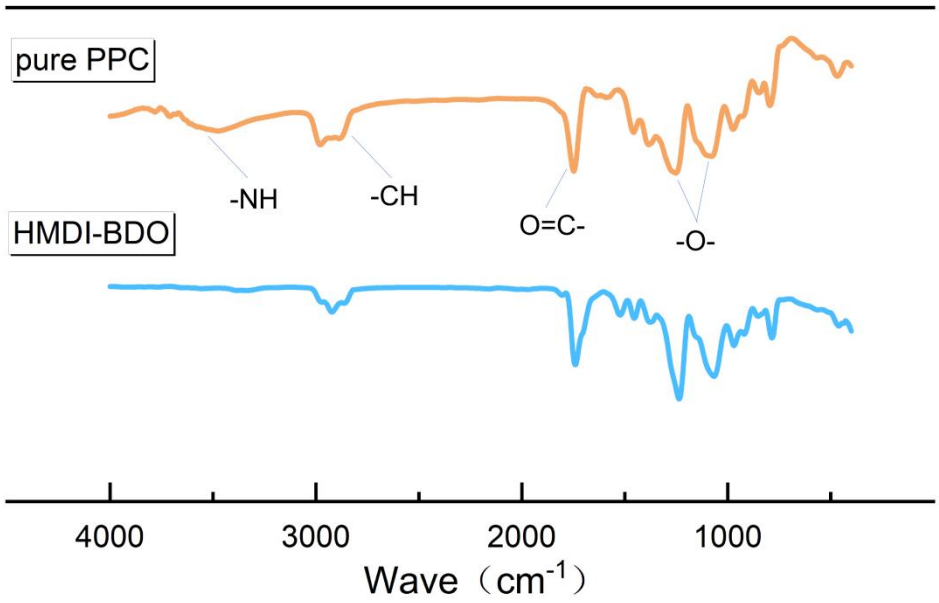


Supplementary Figure 1. Flow Chart of Polyurethane Synthesis by Prepolymer Method

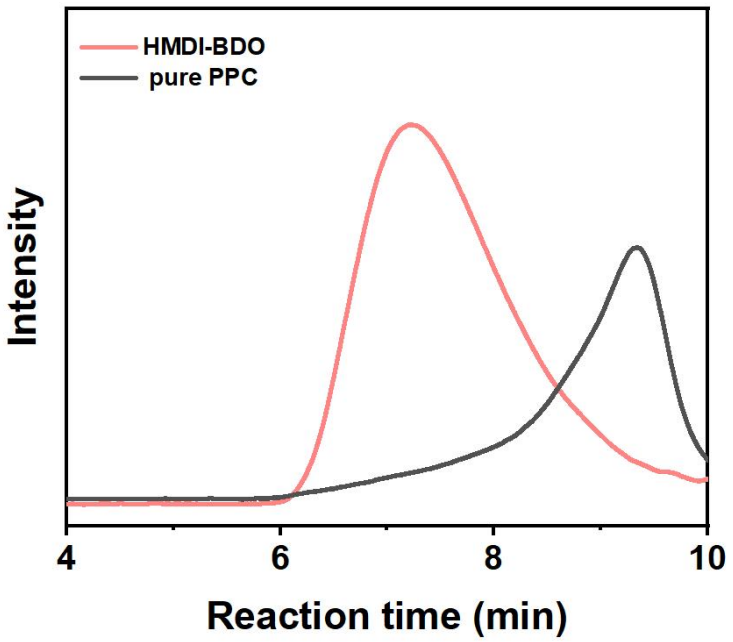
As shown in **Supplementary Figure 1,** we prepared PPC-TPU chain extension system samples using the prepolymer method. Firstly, the low molecular weight PPC polyol is reacted with an excess of 4,4 '- dicyclohexylmethane diisocyanate (HMDI) to form a prepolymer with terminal NCO. Then, 1,4-butanediol (BDO) is added to react to generate polyurethane elastomer. Specific experimental steps: Add weighed PPC to a three port flask equipped with a thermometer and a stirring rod, fix it above the oil bath, adjust the speed to 130, and let it mix evenly; Keep the temperature of the reaction system at no more than 50 ℃. First, add tin dibutyl lauric acid catalyst with a mass of one thousandth of the total, set - NCO/- OH=1.3, quickly pour the weighed HMDI, cover the grinding plug, and wait for the temperature of the reaction system to stabilize before entering the oil bath. React at 85 ℃ for 1 hour, cool to 50 ℃, add BDO, and continue the reaction at 85 ℃ for 1 hour; Then cool to 40-50 ℃, add BDO in a molar ratio equal to the remaining - NCO, quickly mix for 1-2 minutes. After the reaction is completed, quickly pour the solution into the mold, first place it in a 90 ℃ oven for 2 hours, and then rise to 110 ℃ for 4 hours of curing. The extended chain sample is named HMDI-BDO.



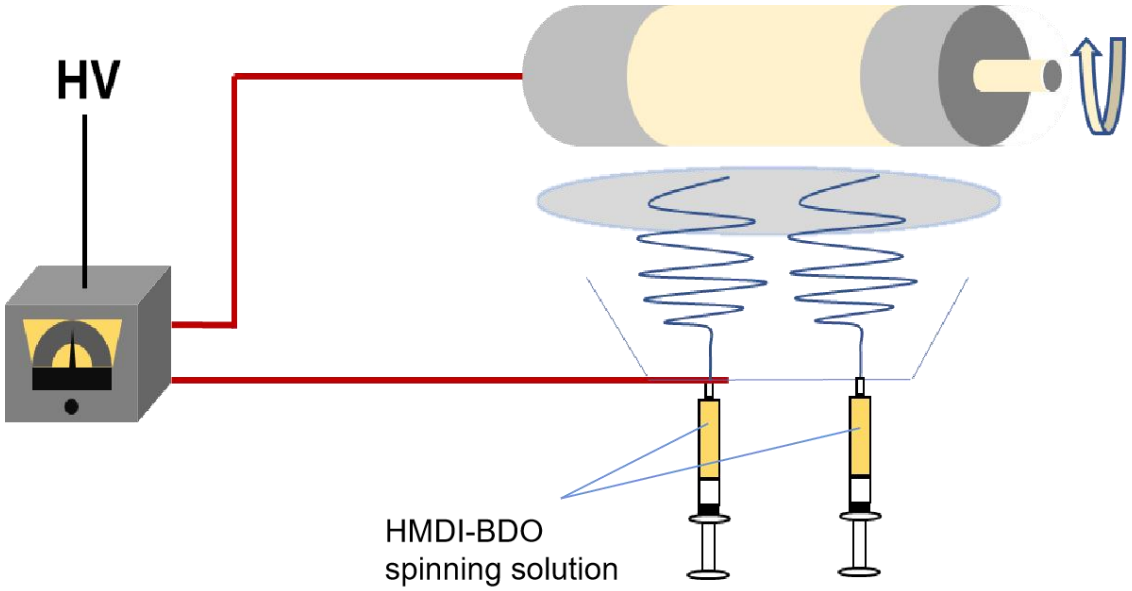
Supplementary Figure 2. (a) Physical image of PPC polyols; (b) Physical image of the extended chain sample; (c) Physical image of chain expansion granulation



Supplementary Figure 3. Comparison of Infrared Spectral Characterization between Pure PPC and HMDI-BDO

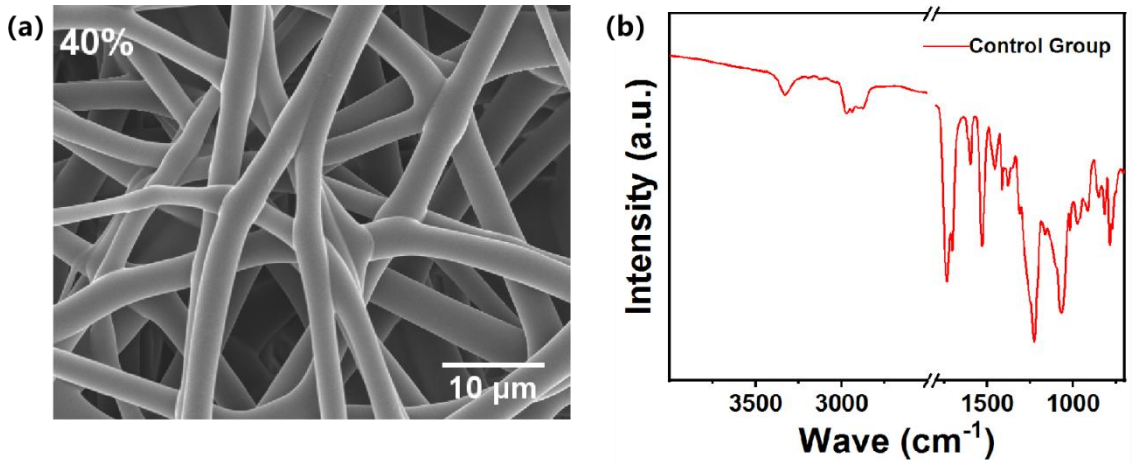


Supplementary Figure 4. Comparison of GPC Characterization between Pure PPC and HMDI-BDO



Supplementary Figure 5. Schematic diagram of PPC nanofiber membrane prepared by electrospinning

As shown in **Supplementary Figure 5**, nanofiber membranes are prepared using electrospinning technology. A 5ml syringe is used to absorb 2ml of spinning solution, exhaust the air inside the tube, connect the 18th needle (inner diameter 0.84mm), and place it in an electrospinning machine. The needle and the receiving roller are connected to the positive and negative voltage poles respectively. Electrospinning parameters: the liquid supply speed is 1ml/h, the distance from the needle to the receiving roller is 15cm, the receiving roller speed is 200r/min, the applied voltage is 17-18kV, the temperature is (23 ± 1.5) ℃, and the relative air humidity is (40 ± 5)%.



Supplementary Figure 6. Dissolve 40% of the HMDI-BDO chain extension sample in a solvent system of acetone: DMF=3:7, add a stirrer, heat and stir on a 50 ℃ magnetic stirrer for 3-4 hours until HMDI-BDO is completely dissolved, and proceed with electrospinning. (a) SEM image of electrospinning; (b) Infrared spectroscopy characterization.