

Supplementary Information

Regulation of Polylactic Acid Using Irradiation and Preparation of PLA-SiO₂-ZnO Melt-Blown Nonwovens for Antibacterial and Air Filtration

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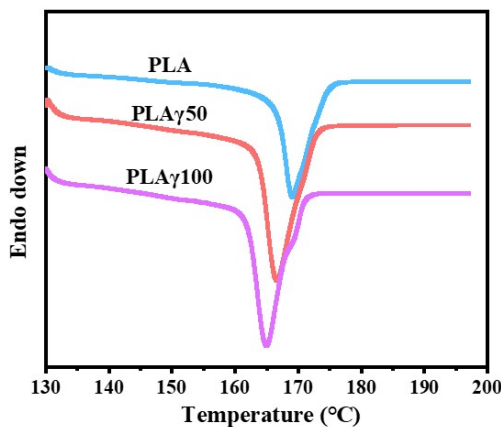


Fig. S1 Effect of irradiation on the structure of PLA. DSC Isothermal crystallization diagram.

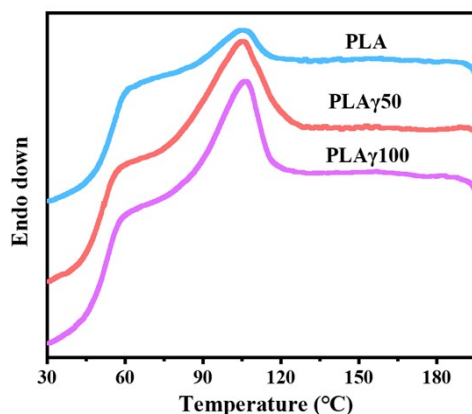


Fig. S2 Effect of irradiation on the structure of PLA. DSC cooling diagram.

The cooling and isothermal crystallization curves of PLA, PLA γ 50, and PLA γ 100 are shown in Fig. S1 and S2. Clearly, the crystallinity of PLA γ 50 was the highest during the cooling and isothermal crystallization process, with maximum values of 8.5% and 44%, respectively. Thus, the lowest T_g and the highest crystallinity of PLA γ 50 indicated outstanding chain migration capacity and crystallization ability.

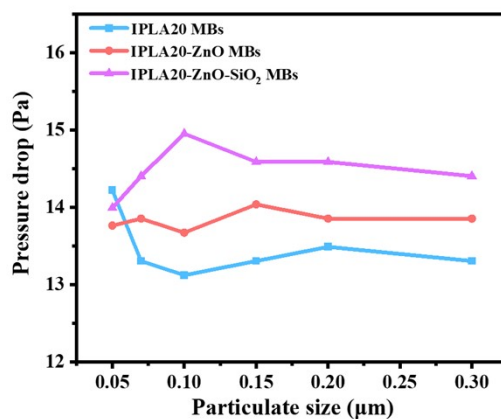


Fig. S3 the variations in pressure drop for particulate filtering after electret postprocessing.

The variations in pressure drop for particulate filtering after electret postprocessing are shown in Fig. S3. As can be seen, the pressure drop of MBs was maintained between 12 and 15 Pa and substantially smaller than that of PP MBs, providing much with better comfort.

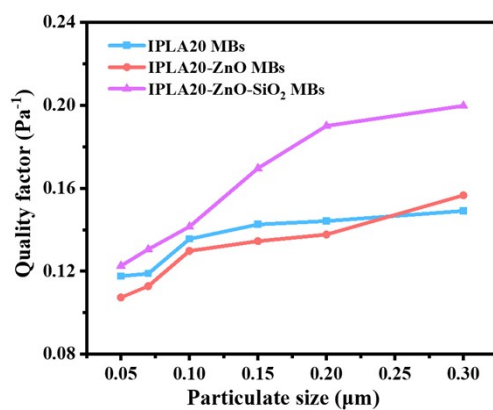


Fig. S4 the variations in quality factor values for particulate filtering after electret postprocessing.

In Fig. S4, the quality factor (QF) values of IPLA20 MBs and IPLA20-ZnO-SiO₂ MBs also increased with the increase in particulate size. And the maximum value of IPLA20-ZnO-SiO₂ MBs was 0.2 Pa⁻¹, higher than 0.15 Pa⁻¹ of IPLA20 MBs, indicating that IPLA20-ZnO-SiO₂ MBs have excellent filtration performance due to the assistance of electret SiO₂.