Supporting Information for

Flexible, Antibacterial Porous Phase Change Thermal Management Film Prepared by a One-Step Extrusion Casting-Foaming Method

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Figure Number: 8

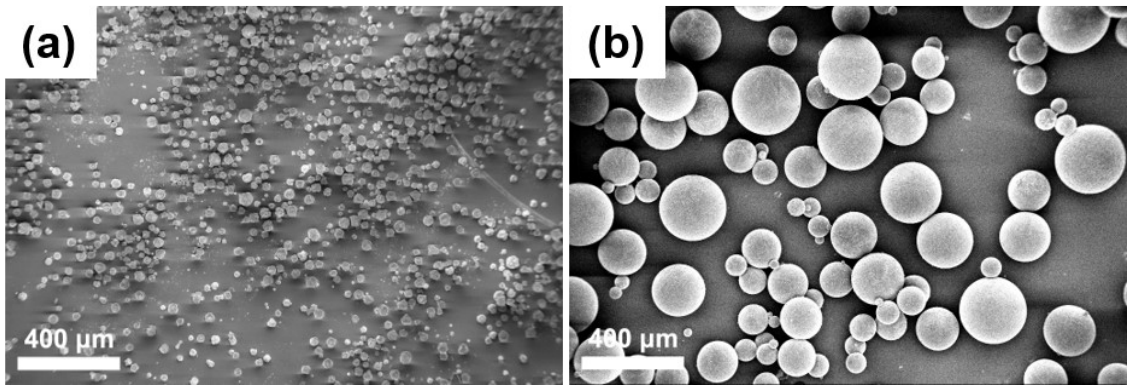

Figure S1. SEM micrographs of a) as-received EMs, b) expanded EMs in air.

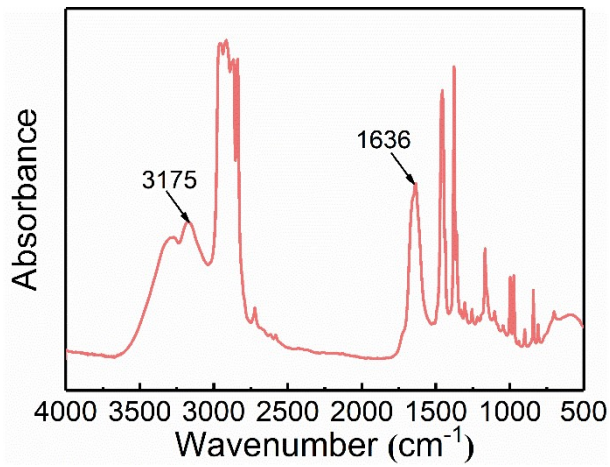

Figure S2. Infrared spectra of ab-PP masterbatch.

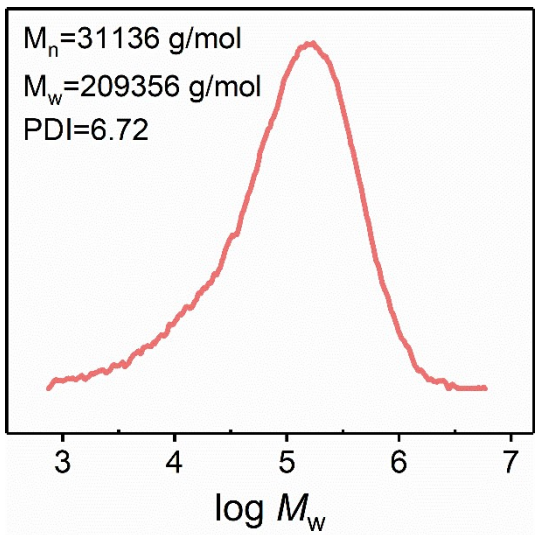

Figure S3. GPC results of ab-PP masterbatch.

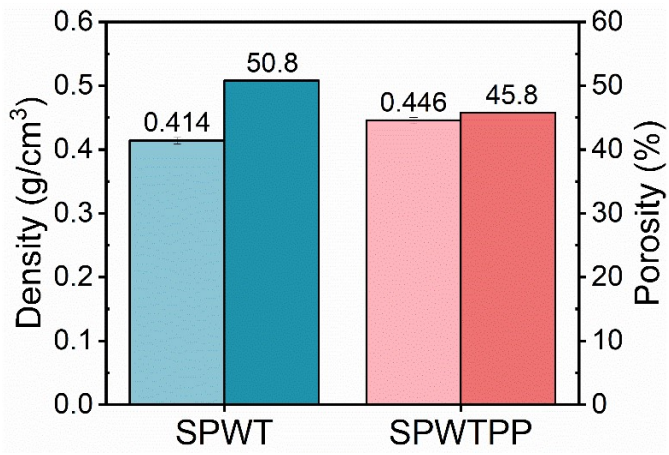

Figure S4. Density and porosity of SPWT and SPWTPP.

The porosity (φ_{gas}) could be calculated by Eq. (1)-(4):

$$\varphi_{gas} = (V_{gas}/V_{total}) \times 100\% \quad (1)$$

$$V_{gas} = V_{total}\text{-}V_{solid} \quad (2)$$

$$V_{total} = m(SPWT)/\rho(SPWT) \quad (3)$$

$$V_{solid} = m(SPWT_{solid})/\rho(SPWT_{solid}) \quad (4)$$

Where φ_{gas} was porosity of SPWT, V_{gas}, V_{solid} and V_{total} were the volumes of gas in TEMs, solid part (including SEBS/paraffin substrate and TEMs shell) and the whole SPWT. The m(SPWT) and m($SPWT_{solid}$) were the mass of SPWT phase change foaming film and unfoamed SPWT composite. It should be noted that the weight of m($SPWT_{solid}$) was equal to m($SPWT_{solid}$) because the weight remained unchanged after foaming for the same piece of SPWT film. The φ_{gas} of SPWT and SPWTPP calculated by the above formulas were 50.8% and 45.8% when ignoring the air quality.

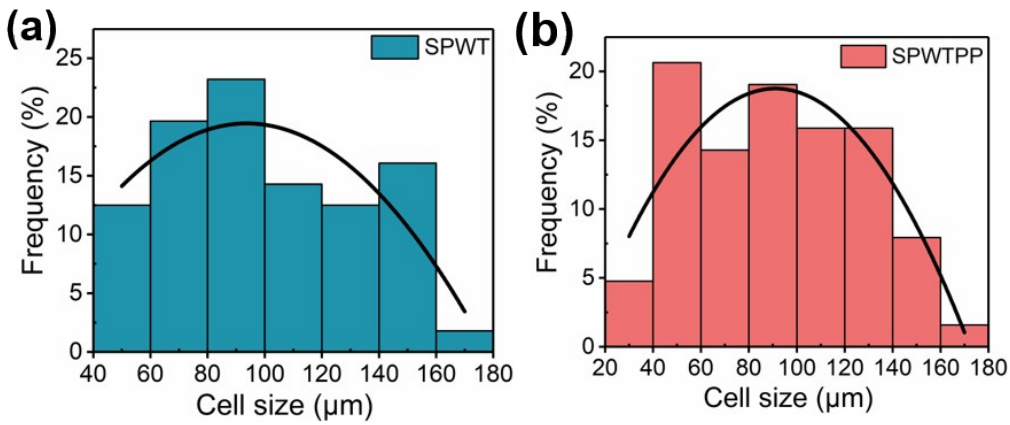

Figure S5. Diameter distribution histograms of a) SPWT and b) SPWTPP.

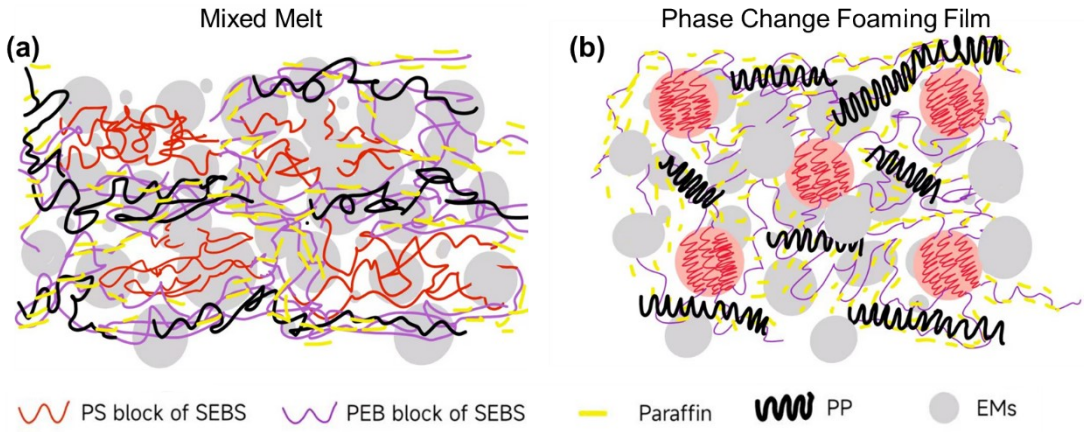

Figure S6. Schematic diagrams of the SPWPP film structure at (a) high temperature and (b) usual temperature.

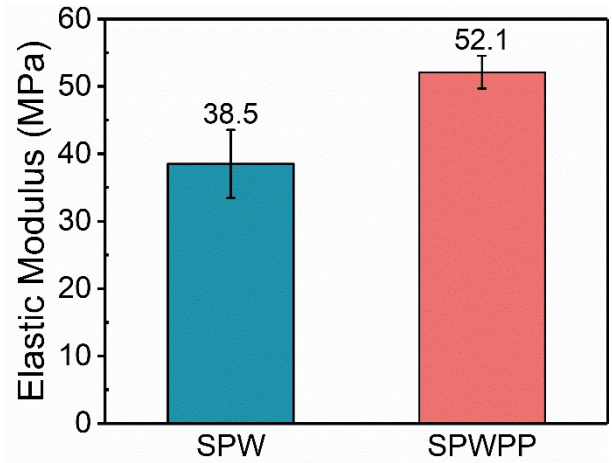

Figure S7. Elastic modulus of SPW and SPWPP.

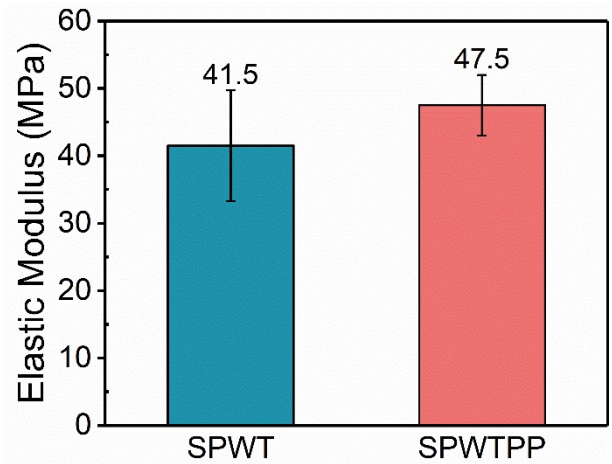

Figure S8. Elastic modulus of SPWT and SPWTPP.