Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Electronic Supplementary Information for

Shape-stabilized phase change materials supported by eggplants-derived porous carbon for efficient solar-to-thermal energy conversion and storage

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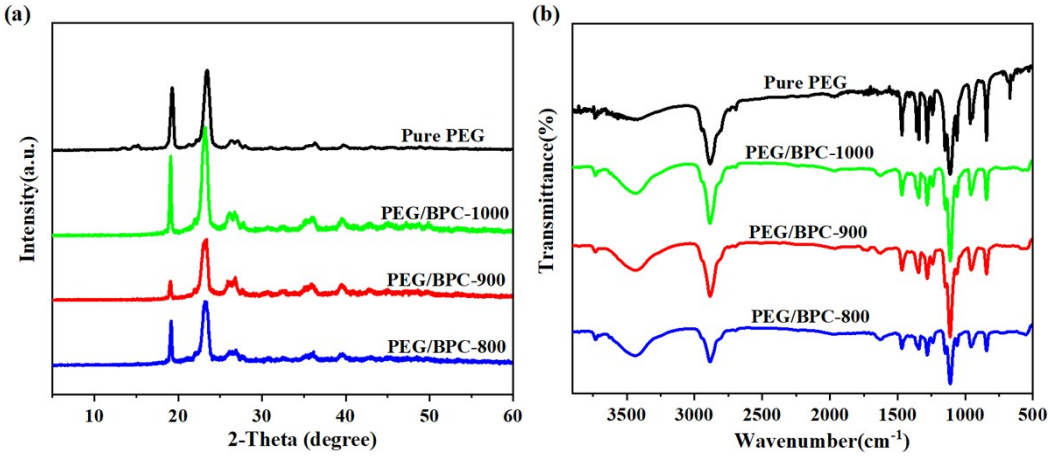

Figure S1. (a) XRD patterns of PEG and the prepared PEG/BPC ss-CPCM (b) FT-IR spectrums of PEG and the prepared PEG/BPC ss-CPCM.

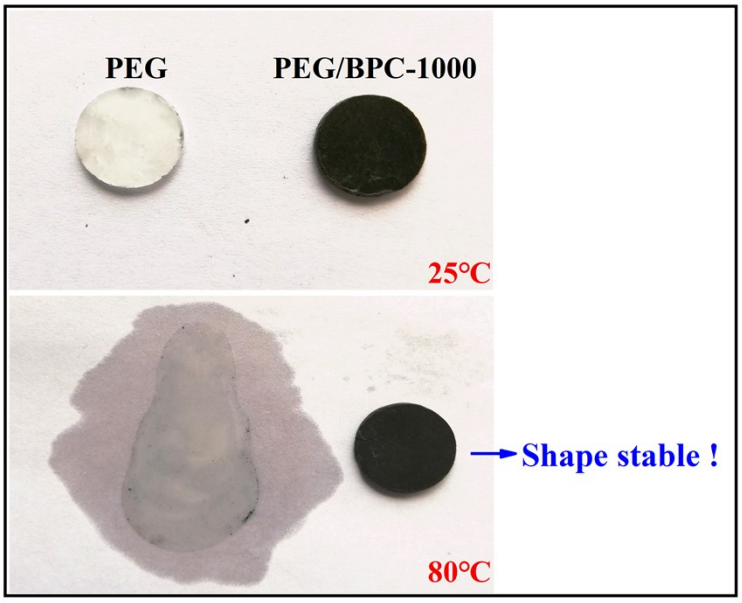

Figure S2. The digital photograph of PEG and PEG/BPC-1000 before and after heating at 80℃.

Fig. S2 shows the photographs of the PEG and PEG/BPC-1000 before and after being heating up to 80℃. After being heated to above its melting temperature, the PEG melted completely into liquid. At the same time, the surface of PEG/BPC-1000 was moist due to the melting of the PEG, but no liquid leakage from the composites was observed.

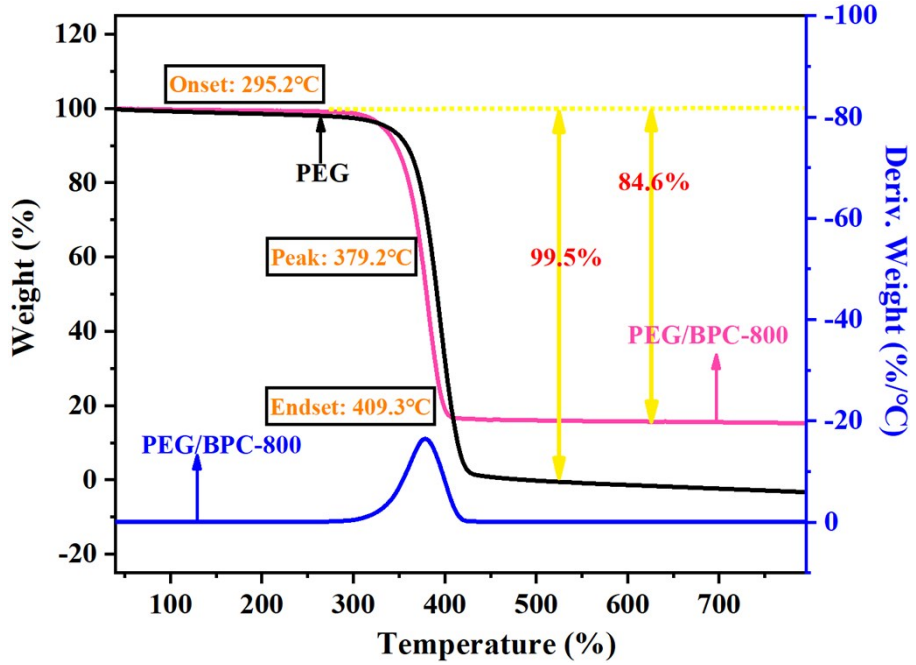

Figure S3. TGA curves of pure PEG and PEG/BPC-800 ss-CPCM and the corresponding DTG thermograms of PEG/BPC-800 ss-CPCM.

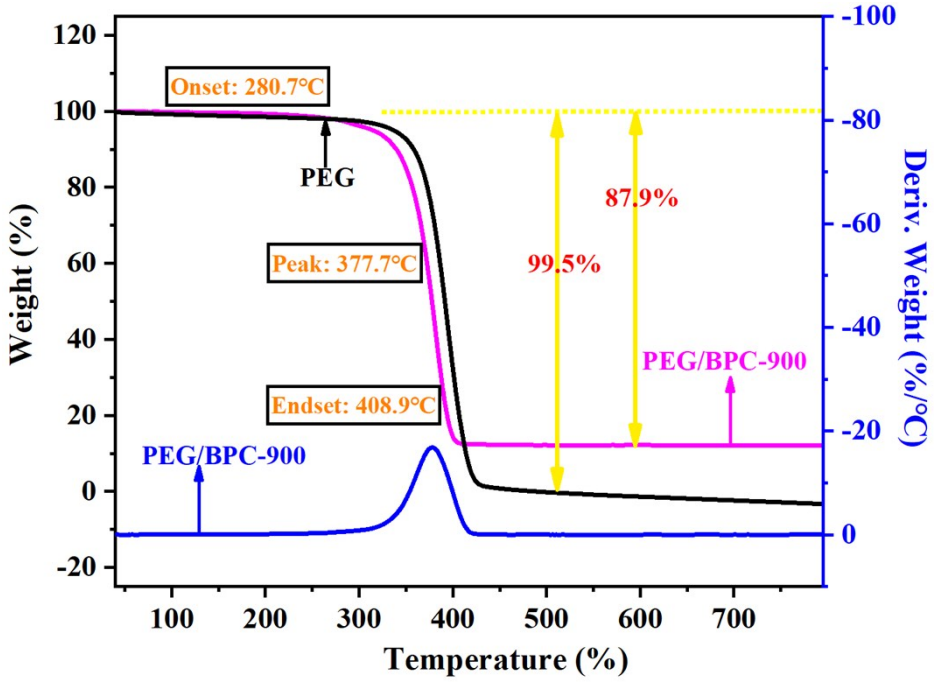

Figure S4. TGA curves of pure PEG and PEG/BPC-900 ss-CPCM and the corresponding DTG thermograms of PEG/BPC-900 ss-CPCM.

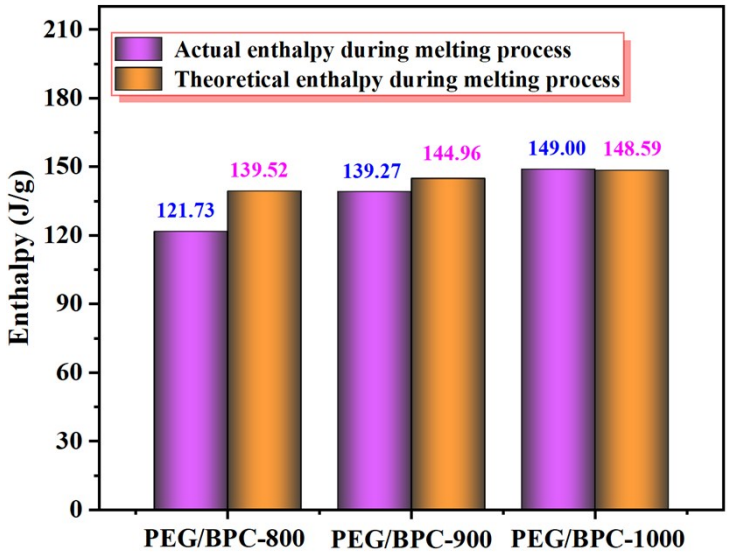

Figure S5. Comparison of theoretical enthalpy and actual enthalpy during melting process.

The absolute crystallinity (*F*c) of the PCMs in the phase change composite materials can be calculated by the formula (1),

$$Fc = \frac{\Delta H_{PCM}}{\Delta H_{Pure}\beta} \quad (1)$$

where ΔH_{Pure} and ΔH_{PCM} are the melting latent heat of the core material and the phase change composite material, respectively; β represents the contents of the PEG material in PEG/BPC ss-CPCMs. The crystallinity of PEG/BPC-800, and PEG/BPC-900, and PEG/BPC-1000 ss-CPCMs was calculated to be 87.24%, 96.07%, 100.27% in melting process, as shown in Figure S6.

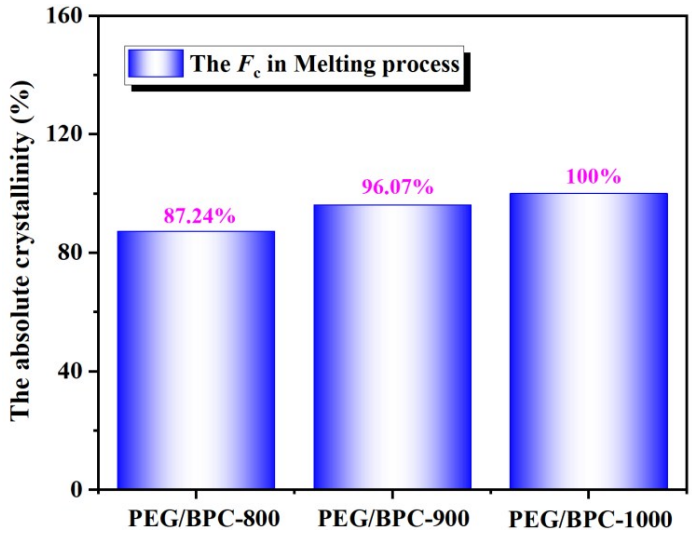

Figure S6. The absolute crystallinity comparison diagram melting and solidify

processes.