## **Supporting Information**

## High-temperature ternary Cu-Si-Al alloy as a core-shell microencapsulated phase change material: Fabrication via dry synthesis method and its thermal stability mechanism

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Figure S1. Cu-Si-Al based alloy phase diagram calculated by FactSage 8.2.



**Figure S2.** Thermogravimetric (TG) curves during heat-oxidation treatment of MEPCM-Alumina-AlOOH at 950 °C, 1000 °C, and 1050 °C for three hours in an O<sub>2</sub> environment.



Figure S3. X-ray diffraction (XRD) patterns of MEPCM after 600 cyclic tests.



Figure S4. SEM images and EDS elemental mapping after 600 cyclic tests.



Figure S5. EDS elemental mapping of the cross-section of MEPCM-Alumina.



Figure S6. EDS elemental mapping of the cross-section of MEPCM-Alumina-AlOOH.



Figure S7. EDS elemental mapping of the cross-section of MEPCM-AlOOH.