

Supplementary Information

Preparation of inorganic molten salt composite phase change materials and study on their electrothermal conversion properties

Jiandong Zuo,^a Hongjie Luo,^a Ziye Ling,^{*ab} Zhengguo Zhang,^{*ab} Xiaoming
Fang^{ab} and Weiwei Zhang^c

^a Key Laboratory of Enhanced Heat Transfer and Energy Conservation, The Ministry
of Education, School of Chemistry and Chemical Engineering, South China
University of Technology, Guangzhou 510640, China

^b Guangdong Engineering Technology Research Center of Efficient Heat Storage and
Application, South China University of Technology, Guangzhou 510640, China

^c Gmerit Holdings Ltd., Foshan 528000, China

* Corresponding author, e-mail: zyling@scut.edu.cn, cezhang@scut.edu.cn

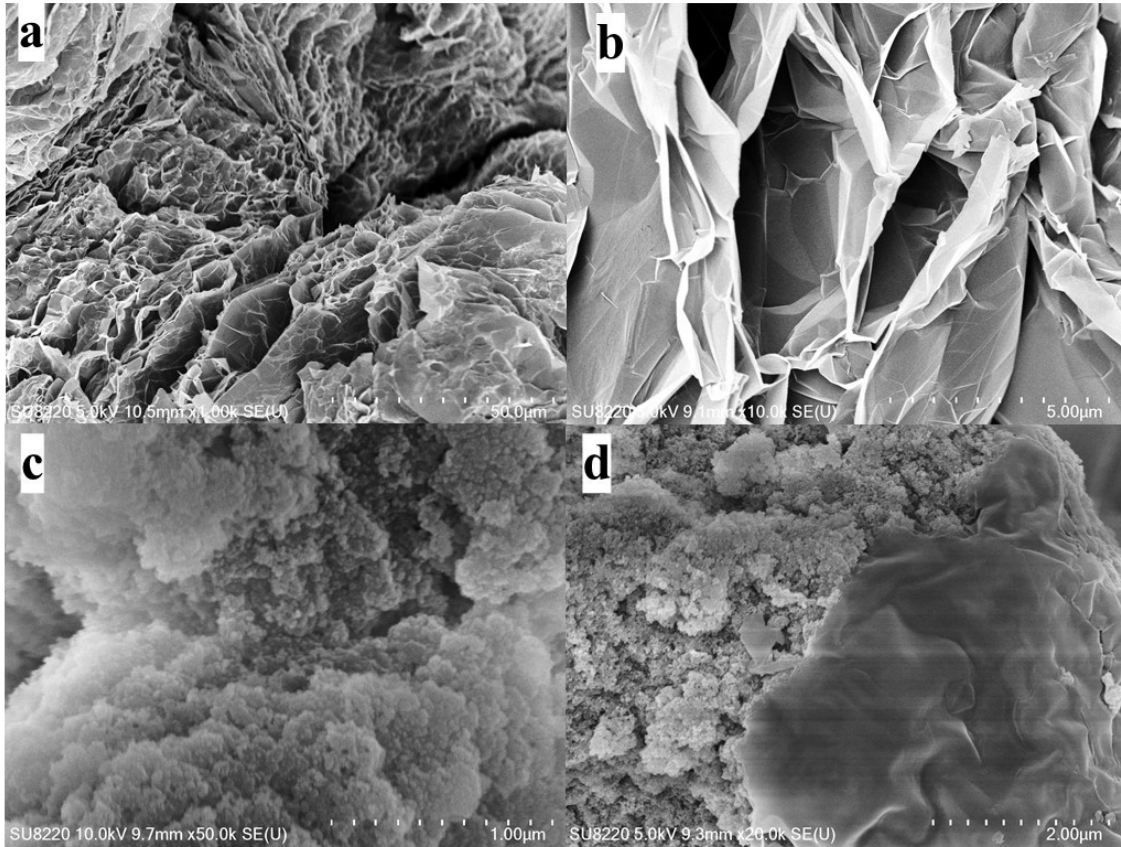


Fig. S1 The micromorphology of each substance. (a, b) EG; (c) LiNO₃-KCl/SiO₂; (d) LiNO₃-KCl/SiO₂/EG.

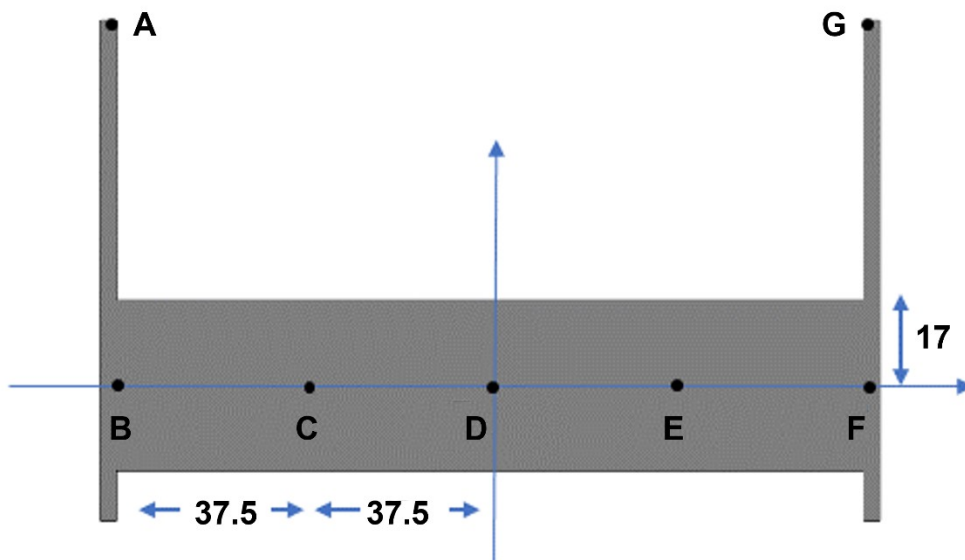


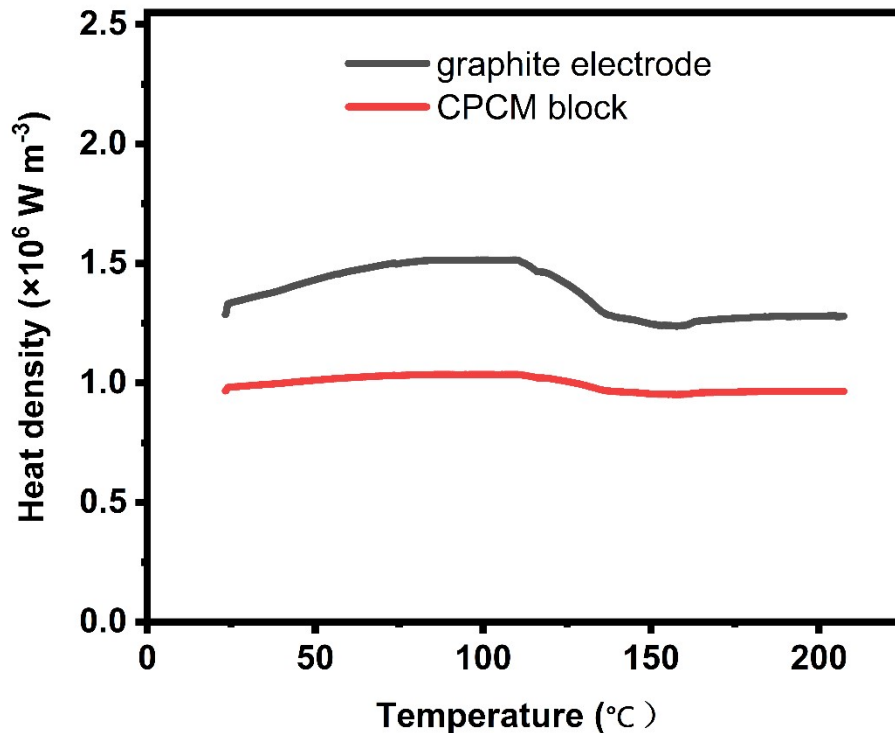
Fig. S2 Temperature monitoring point distribution.

Table S1 Physical properties of materials.

| | graphite electrode | CPCM block |
|--|--------------------|------------|
| specific heat ($\text{J g}^{-1} \text{K}^{-1}$) | 0.71 | 1.45 |
| thermal conductivity ($\text{W m}^{-1} \text{K}^{-1}$) | 121 | 5.2 |

Table S2 Parameter setting values of each component under simulated working conditions

| | graphite electrode | potting compound | CPCM block |
|--|---|------------------|--|
| specific heat capacity / $\text{J g}^{-1} \text{K}^{-1}$ | 0.71 | 1 | The function of the 6 wt% curve in Figure 2b. |
| density / g cm^3 | 1.8 | 1.3 | 1.8 |
| thermal conductivity / $\text{W m}^{-1} \text{K}^{-1}$ | 121 | 0.4 | 5.2 |
| heat generation density / W m^{-3} | Fig. S3 Graphite electrode heat generation density function | 0 | Fig. S3 Heat generation density function of the CPCM block |

**Fig. S3** The heating density curve of graphite electrode and composite PCM

block as a function of temperature.

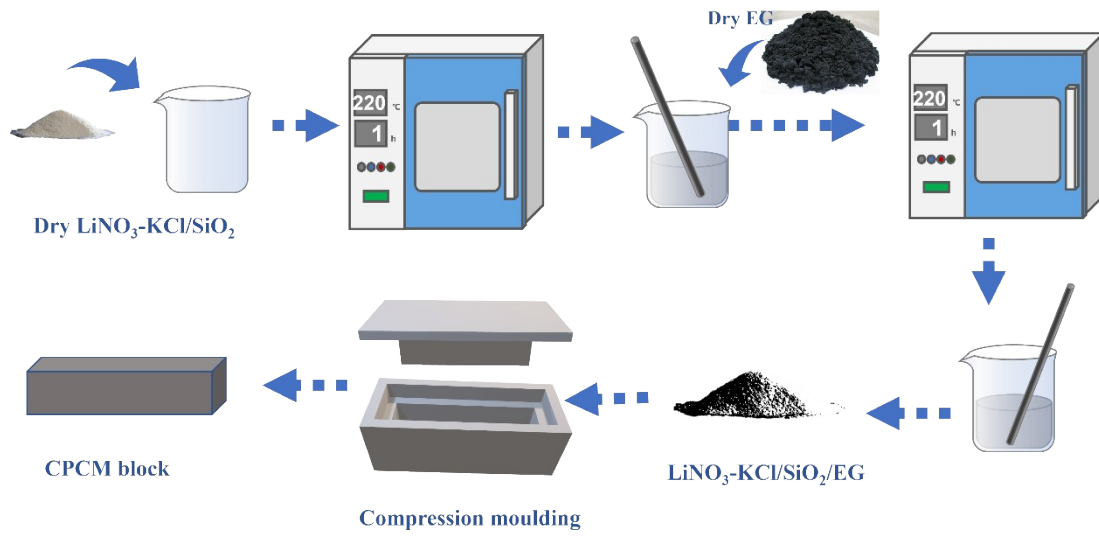


Fig. S4 Composite phase change material preparation process diagram.

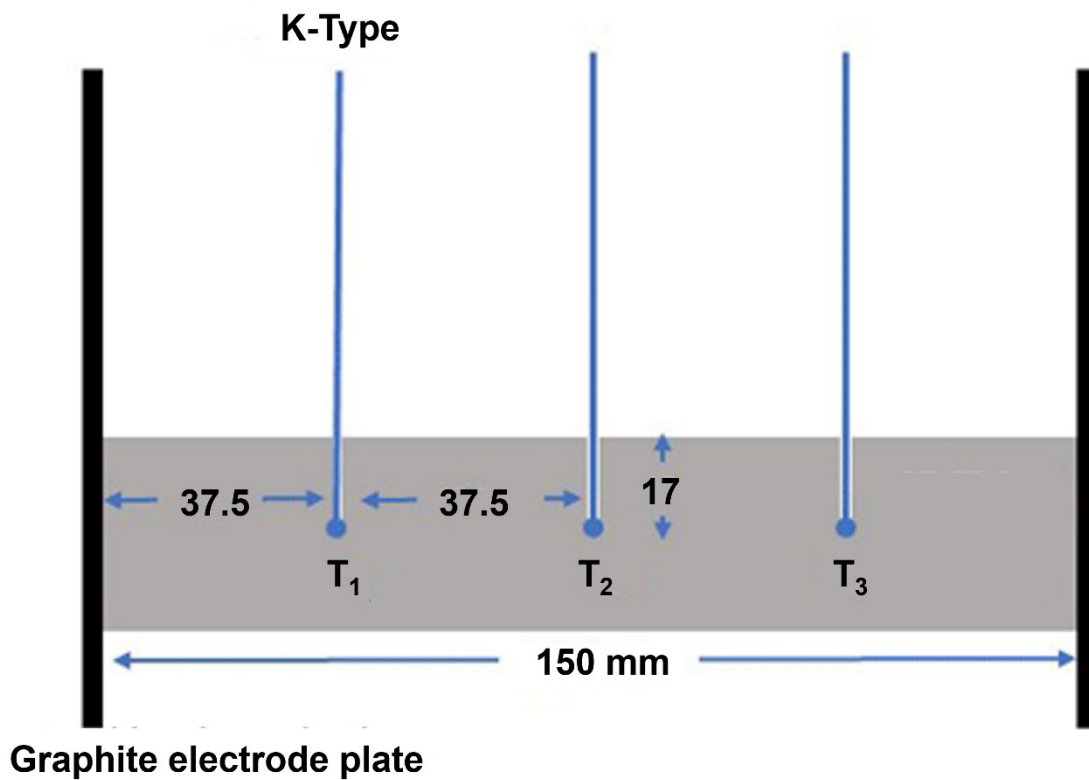


Fig. S5. The distribution of temperature measurement points.

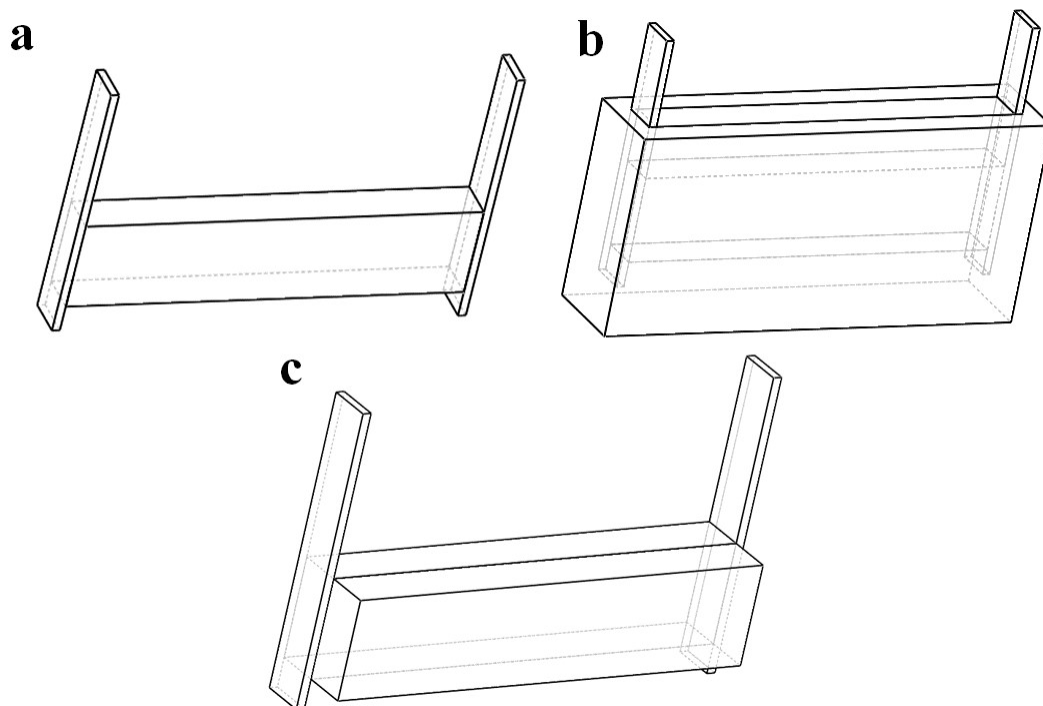


Fig. S6. Three-dimensional graphics of EThCM. (a) Before potting; (b) After potting;
(c) Indirect heating.