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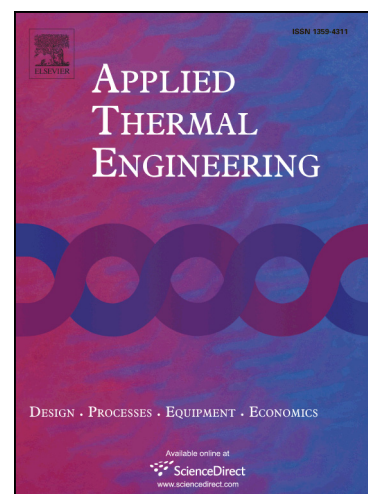
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**Phase change behaviour of latent heat storage media based on calcium chloride hexahydrate composites containing strontium chloride hexahydrate and oxidation expandable graphite**

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**Abstract:**

Calcium chloride hexahydrate( $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$ ) composites PCMs containing strontium chloride hexahydrate ( $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$ ) and oxidation expandable graphite(EGO) were prepared and phase change behavior of  $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}/\text{EGO}/\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$  composite PCMs, including supercooling degree, phase change temperature, latent heat, density, thermal conductivity and thermal stability were systematically studied. Results demonstrate that thermal conductivity, heat transfer and the latent capacities of the  $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}/\text{SrCl}_2 \cdot 6\text{H}_2\text{O}/\text{EGO}$  composite PCMs are significantly enhanced, supercooling of  $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}/\text{SrCl}_2 \cdot 6\text{H}_2\text{O}/\text{EGO}$  composite PCMs are suppressed, mainly ascribe to that the EGO are homogenously dispersed in PCMs due to the existence of oxygen-containing functional groups in EGO, meanwhile, the well-dispersed EGO serving as nuclei to promote the heterogeneous nucleation and crystallization process of  $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$ . Moreover, a fifty-run-cycling test verifies that the  $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}/\text{SrCl}_2 \cdot 6\text{H}_2\text{O}/\text{EGO}$  composites PCMs contained with 3wt.%  $\text{SrCl}_2 \cdot 6\text{H}_2\text{O}$ , and 1.0wt.% EGO possesses enhanced thermal behavior with no phase segregation observed; the latent heat was calculated to be 172.26 J/g.

**Keywords:** Phase change material (PCM); Oxidation expandable graphite (EGO);  $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}/\text{SrCl}_2 \cdot 6\text{H}_2\text{O}/\text{EGO}$  composites; Phase change behavior

**1. Introduction**

Phase change materials (PCMs) offer an effective route for the efficient usage of latent thermal energy. PCMs are commonly adopted for thermal energy storage field applications e capability of operating under low/medium temperatures and unstable energy storage fields, such as solar energy, industrial waste heat, intermittent electric heating energy, ect [1-4]. The study and development of PCMs that demonstrate high performance is of great significance in developing more efficient routes of energy

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