Solid-liquid energy storage materials

Are solid-liquid phase change materials suitable for latent heat thermal energy storage?
This paper provides a review of the solid-liquid phase change materials (PCMs) for latent heat thermal energy storage. The thermal properties and shortcomings of the PCMs are summed up firstly. Then, performance improvements of PCMs are discussed. And the applications used for thermal energy storage and thermal management are analyzed.

What are solid-liquid PCMs used for thermal energy storage?
Solid-liquid PCMs commonly used for thermal energy storage include organic PCMs (paraffins) and Inorganic PCMs (salt hydrates), or various mixtures thereof (eutectics). Various strategies are often used to enhance the performance of SL-PCMs for thermal storage applications by addressing their inherent drawbacks.

What is a thermal energy storage material?
During discharge, the thermal energy storage material transfers thermal energy to drive the heat pump in reverse mode to generate power, as well as lower-grade heat that can be used in various other applications.

What are solid-solid phase change materials (SS-PCMs) for thermal energy storage?
Solid-solid phase change materials (SS-PCMs) for thermal energy storage have received increasing interest because of their high energy-storage densityand inherent advantages over solid-liquid counterparts (e.g.,leakage free,no need for encapsulation,less phase segregation and smaller volume variation).

What are the different modes of thermal energy storage?
Various modes of thermal energy storage are known. Sensible heat storagerepresents the thermal energy uptake owing to the heat capacity of the materials over the operational temperature range. In latent-heat mode,the energy is stored in a reversible phase transition of a phase change material (PCM).

Why do latent heat storage systems undergo solid-liquid phase transitions?
The most commonly used latent heat storage systems undergo solid-liquid phase transitions due to large heat storage density and small volume change between phases.

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