



Modelling Advanced Materials and Systems for Thermal Energy Storage

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Message from the Guest Editors

Thermal Energy Storage (TES) technologies are essential for moving towards a more reliable and competitive exploitation of intermittent sources of heat. In this regard, one of the most crucial aspects is the material adopted to store the thermal energy. A relevant approach for short-term TES is based on phase change materials, which can ensure higher energy density than traditional sensible heat storage systems while keeping low cost and high cyclability. In these composites, micro- or nano-fillers are introduced in the base TES material, to enhance its effective properties. The current challenge is predicting the heat and mass transfer and thermal storage performance throughout the different scales of interest, thus correlating the molecular features of TES materials with the effective response of TES systems.

Keywords

- Thermal energy storage
- Latent heat storage
- Thermochemical heat storage
- Phase change materials
- Composite materials
- Sorption materials
- Molecular dynamics
- Mesoscopic modelling
- Continuum modelling
- System modelling





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