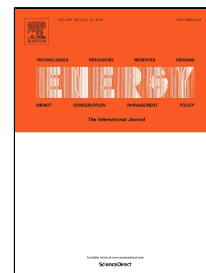


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Experimental investigation on n-octadecane/polystyrene/expanded graphite composites as form-stable thermal energy storage materials

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**Experimental investigation on n-octadecane/polystyrene/expanded
graphite composites as form-stable thermal energy storage materials**

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Abstract: In this work, polystyrene-based form-stable composite phase change materials (CPCMs) were fabricated by a solution and reflux method. In the composites, the n-octadecane (ODE) was used as thermal energy storage material, the polystyrene (PS) acted as the supporting material, and expanded graphite (EG) was employed as thermal conductive filler to improve the thermal conductivity of the composites. The toluene was adopted as solvent. Both polystyrene and n-octadecane smoothly dissolve in toluene. EG was also easily dispersed into the matrix. CPCMs were obtained after distillation of the toluene. The differential scanning calorimeter (DSC) and a thermogravimetry analyzer (TGA) were adopted to assess the thermal properties and thermal stability of the CPCMs, respectively. Fourier transformation infrared (FT-IR) spectroscope and scanning electronic microscope (SEM) were utilized to determine the chemical structure and microstructure of the ODE/PS/EG composites. The thermal conductivity of the CPCM with 5 wt% content of EG can

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