

## Paraffin/Expanded Perlite Composite as a Novel Form-Stable Phase Change Material for Latent Heat Energy Storage

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**Abstract :** Latent heat storage using Phase Change Materials (PCMs) has attracted growing attention recently in the renewable energy utilization and building energy efficiency. Paraffin (PA) of low melting temperature, which is close to human comfort temperature in the range of 24-28 °C has been considered to be used in building applications. A form-stable composite Paraffin/Expanded perlite (PA-EP) has been prepared by retaining PA into porous particles of EP. DSC (Differential scanning calorimeter) is used to measure the thermal properties of PA in the form-stable composite with/without building materials. TGA (Thermal gravimetric analysis) shows that the composite is thermally stable. SEM (Scanning electron microscope) demonstrates that the layer structure of the EP particles is uniformly absorbed by PA. The mechanical properties in flexural mode have been discussed. The thermal energy storage performance has been evaluated using a small test room (100 mm ×100 mm ×100 mm) with thickness 10 mm. The flammability test of modified sample has been discussed using a cone calorimeter. The results confirm that the form-stable composite PA has the function of reducing building energy consumption.

**Keywords :** flammability, latent heat storage, paraffin, plasterboard

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