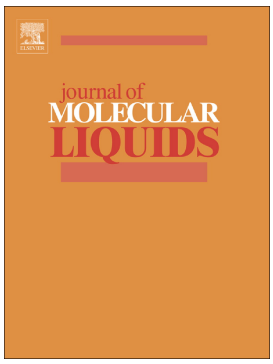

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Numerical modeling of Nano enhanced PCM solidification in an enclosure with metallic fin

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Abstract

Solidification process of Nano enhanced phase change material (NEPCM) is simulated in existence of radiative heat transfer. H_2O and CuO are utilized as PCM and nanoparticles, respectively. Finite element method with adaptive mesh is employed to simulate this transient problem. Effects of fin length, size of nanoparticle, nanofluid volume fraction, radiation parameter on solidification process have been investigated. Results indicate that solidification rate enhances by dispersing CuO nanoparticles in to water. As *L* and *Rd* augments, solidification process is completed in lower time and total energy reduces.

Keywords: Nanoparticle; Thermal radiation; FEM; Nano enhanced PCM; Solidification.

Nomenclature

PCM	Phase change Material	ρ	Fluid density

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