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Recent progress in solar thermal energy storage using nanomaterials (Review)

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Abstract

Use of thermal energy storage (TES) materials in solar collectors is known to be the most effective way of storing thermal energy. The most conventional and traditional heat storage element is water. However, due to low thermal conductivity (TC) in vapor state its applications as a heat storage medium are limited. An alternative option is to utilize organic and inorganic TES materials as they both operate at low and medium temperature ranges. Organic TES materials such as paraffins are non-corrosive and possess high latent heat capacity. On the contrary, inorganic TES materials possess high density and appreciable specific heat capacity (SHC). Due to rapid progress and advancement in nanotechnology, varieties of nanomaterials were dispersed in various base fluid(s) to enhance thermo-physical properties. This review paper presents the current status and future development trends of TES materials. Furthermore, an extensive research on enhancement of TC and SHC of various TES material doped with nanomaterials has been discussed. © 2016 Elsevier Ltd

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