

Extended Abstract

# Novel Formulations of PEG–Silica Phase-Changing Materials (PCMs) with Applications in Passive Storage of Thermal Energy <sup>†</sup>

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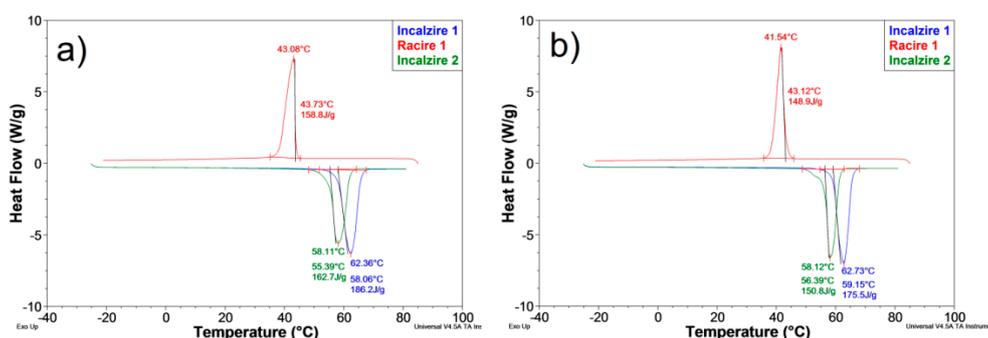
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The aim of the present study is to design new PEG–silica hybrids (PEG<sub>x</sub>–Si) as phase changing materials that can be integrated into construction elements for green buildings with positive impacts on different aspects such as saving of primary energy (expensive energy), reduction of maintenance costs (economic aspect), and increasing the thermal comfort of the inhabitants (environmental aspects) [1]. In order to prevent PEG’s flow or solubilization, it needs to be stabilized or incorporated in different matrices while retaining its thermal energy storage capacity [2]. Our approach to overcome these problems consists in the covalent bonding of a fraction of PEG chains to an in situ generated silica network, forming the so-called PEG–silica hybrid systems. (Figure 1).



**Figure 1.** DSC curves of mixtures of PEG<sub>4000</sub>–Si with (a) PEG<sub>4000</sub> and (b) PEG<sub>6000</sub> at a 1:1 ratio (grav.).

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