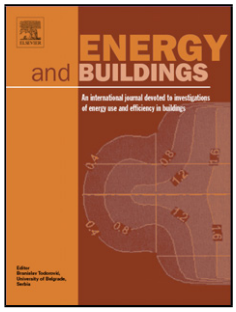

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A novel binary mixture of caprylic acid/nonanoic acid as latent heat storage for air conditioning and cooling

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Abstract :

The thermal properties of caprylic acid, nonanoic acid and their binary system were investigated by differential scanning calorimetry (DSC). The phase diagram for the binary system was constructed, and the experiment results showed that the eutectic temperature and the molar fraction of caprylic acid for the eutectic mixture are 1.83℃ and 0.483, respectively. To satisfy the application demands of the temperature scope from 5℃ to 15℃, another binary mixture for the binary system with a molar fraction of 0.814 for caprylic acid component is found successfully, and it has good thermal properties that the melting temperature and the latent heat are 7.6℃ and 123J·g^{-1}, respectively. What is more, the latent heat and melting temperature for the binary mixture do not change at all nearly after being cycled 100 times during the whole melting process. As a novel phase change material (PCM) for application in the field of air conditioning and cooling, the binary mixture has own unique thermal advantages.