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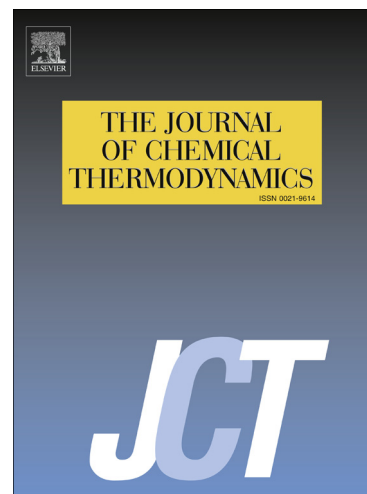
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# Solid-liquid phase equilibria of stearic acid and dicarboxylic acids binary mixtures as low temperature thermal energy storage materials

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## Abstract

This article investigated thermal properties and stabilities of three eutectic mixtures of dicarboxylic acids (DA) and stearic acid (SA) as phase change materials (PCMs) for low temperature thermal energy storage. The solid-liquid phase diagrams were experimentally and theoretically constructed, respectively. The {SA+ adipic acid (ADA)}, {SA+ suberic acid (SUA)} and {SA+ sebacic acid (SEA)} form eutectic mixtures at (96.2, 93.6 and 94.5) mol% of stearic acid SA. The three mixtures display melting onset temperature around (340.60, 339.52 and 340.23) K and latent heat of fusion of (200.30, 191.38 and 196.63) J·g<sup>-1</sup>, respectively. Additionally, the average value of the thermal conductivity of SA-ADA, SA-SUA and SA-SEA eutectic mixture of the solid state at room temperature was determined, and are (0.1439, 0.1720 and 0.1802) W·m<sup>-1</sup>·K<sup>-1</sup>, respectively. In addition, the three mixtures show excellent

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