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A novel fluid-filler/polymer composite as high-temperature thermally conductive and electrically insulating material

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Abstract

Liquid paraffin microcapsules (LPMs) were incorporated into epoxy resin to prepare fluid-filler/polymer composite materials in this work, with the objective of introducing fluid heat convection into thermally conductive and electrically insulating materials. The LPMs were fabricated by coating urea resin onto liquid paraffin via in-situ polymerization, enabling the as-prepared LPMs to experience no weight loss below 240 °C. The heat dissipation efficiency of the LPM/epoxy-resin composite with 25 vol.% LPM content was remarkably improved above 50 °C, although its thermal conductivity was only 0.25 W/(m·K) at room temperature. The enhancement of heat dissipation efficiency above

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