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Thermally Conductive Polymer Composites and Nanocomposites: Processing-Structure-Property Relationships

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Abstract: Rapid fabricating technology advancement in the computing and electronic industries has led to new challenges in thermal management of electronics. As significantly more components are being packed in a smaller footprint in micro-and-nano-electronics, the amount of heat being generated in them has dramatically increased. In this context, efficient thermal management is critical to maintain the performance and reliability of electronic devices. Furthermore, other emerging technologies, such as light emitting diodes, flexible and wearable electronics, as well as electric vehicles, demand novel thermally conductive materials with new attributes (e.g., light-weight and flexible). This review reports key research advancements in elucidating the processing-structure-property relationships of thermally conductive polymer composites and nanocomposites. The recent progresses in processing technologies to tailor the phase morphologies and microstructures of polymer composites and nanocomposites and thereby enhance their effective thermal

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