

Well dispersed MWNTs incorporated in poly(dimethylsiloxane) (PDMS) matrix and their thermal conductivity and rheological properties

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Poly(dimethylsiloxane) (PDMS), silicone rubber, has excellent both low and high temperature resistance, unusual flexibility, chemical resistance, and bio-compatibility. These features makes PDMS as an excellent materials using in automotive, aerospace, coating, medical industries. Recently the use of silicone as a heat sink material is growing where the silicone filled with ceramic fillers effectively dissipates heat generated from electronic components. Therefore the management of heat condition is directly related to the lifetime of electronic devices. Due to the extremely high thermal conductivity of MWNTs, the addition of MWNTs significantly increases thermal conductivity of silicone composite. For high thermal conductivity and other improved properties, silica coated MWNTs and acid modified MWNTs prepared by traditional method were incorporated. The thermal conductivity, mechanical properties, and chemical interaction between the filler and matrix are characterized.