

Reversible thermal conductivity enhancement of phase change composites with single walled carbon nanotube inclusions

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Abstract

We report the thermal conductivity enhancement of phase change alkanes with single walled carbon nanotube (SWNT) inclusions. We used SWNTs grown by alcohol catalytic chemical vapor deposition (ACCVD) method after well characterizing with transmission electron microscopy (TEM), Raman spectroscopy and thermogravimetric analysis. Thermal conductivity measurements in solid and liquid state were carried out using a transient hot wire technique for different SWNT loadings. In the liquid state a nominal increase in thermal conductivity was observed. When the composite was frozen, nearly a two fold increase in thermal conductivity was observed. Similar temperature dependent thermal conductivity behaviour was observed when exfoliated graphite nanoplatelets were used as the inclusions.