

Dispersion of Single-Walled Carbon Nanotubes in Ketone Solvents and Effects of Sonication

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The dispersibility of single-walled carbon nanotubes (SWCNTs) in ketone solvents, acetone and methyl ethyl ketone (MEK), was studied. SWCNTs were successfully dispersed in ketone solvents by sonication and the concentrations of the SWCNT dispersions were increased with the sonication time. The size distribution and UV-Vis absorption measurements showed that the SWCNTs in MEK were uniformly and almost individually dispersed. The zeta potentials of the SWCNTs dispersed in ketone solvents negatively increased with the sonication time. Furthermore, the G/D ratios of the dispersed SWCNTs in MEK were decreased as the sonication time increased. The negative zeta potentials and the decrease in G/D ratios are considered owing to introduction of carboxylic acids induced by sonication in ketone solvents. Although the electrical conductivity of the SWCNTs dispersed in MEK was slightly decreased due to the defects, ketone solvents are practicable dispersing solvents for SWCNTs with relatively low boiling points and high accessibility. SWCNT dispersions in ketone solvents would be suitable for antistatic coatings and nano-fillers for polymer reinforcement.

Keywords : carbon nanotube / dispersion / ketone solvent / sonication