

Cross-linking of Multi-Walled Carbon Nanotubes and Improvement of Mechanical Property of Cross-linked CNT

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Since its report by Iijima in 1991, Carbon Nanotubes(CNTs) have been gained a lot of attention in commercial fields in addition to nanotechnology due to its electronic, mechanical, thermal and optical property. Especially, because of its high strength, it has been used for a variety of fields, such as composite reinforcement, super strong fibers, bucky-papers, metal matrix and space elevator, etc. Multi-walled carbon nanotubes (MWCNTs) have theoretically very high tensile strength of 11-150 GPa and the tensile modulus of 0.27-0.95 TPa. However, the actual strengths are still lower than expectation value. These poorly results are induced from the weak interaction between CNTs. In order to solve this problem, We suggest crosslinking between CNTs. In this work, We will demonstrate a new route of crosslinking MWCNTs. To characterize of cross-linked CNT, Fourier transform infrared (FT-IR) spectroscopy, thermogravimetric analysis (TGA), X-ray photoelectron spectroscopy (XPS) and transmitting electron microscopy (TEM) were used.