

Evolution of Functionalized Multi-Walled Carbon Nanotubes by Dendritic Polymer Coating and Their Anti-Scavenging Behavior During Curing Process

A.K.M. Moshiul Alam^a, M.D.H. Beg^a, R.M. Yunus^a, M.F. Mina^b, K.H. Maria^c, T. Mieno^c

^a Chemical and Natural Resources Engineering, Universiti Malaysia Pahang, Gambang 26300, Kuantan, Malaysia

^b Department of Physics, Bangladesh University of Engineering and Technology, Dhaka 1000, Bangladesh

^c Graduate School of Science and Technology, Shizuoka University, Shizuoka 422, Japan

ABSTRACT

Improvement of curing performance of unsaturated polyester (UPR) by multi-walled carbon nanotubes (MWCNT) is essential for industrial application of MWCNT reinforced UPR nanocomposites. For this purpose, hyper branched polyester coated MWCNT (HBPCNT) has been prepared by solvent evaporation technique, and HBPCNT loaded UPR nanosuspension has been cured and investigated with differential scanning calorimetric method. Structures and morphologies of pristine MWCNTs and HPBCNTs have also been investigated. Significant differences in the natures of these two types of CNTs are observed. HBPCNT remarkably reduces the curing temperature by 13 °C during crosslinking in HBPCNT-UPR nano-suspension, thereby acting as a potential anti-scavenger for curing process.

KEYWORDS: Carbon nanotube; Nanocomposite; Raman; Thermal analysis

DOI: [10.1016/j.matlet.2015.12.130](https://doi.org/10.1016/j.matlet.2015.12.130)