

Soluble Carbon Nanotube through High Degree of Sidewall Functionalization

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Effective side wall functionalization of multi walled carbon nanotube (CNT) with Styrene was carried out. The functionalized CNT was characterized through ^1H and ^{13}C - NMR, FT-IR. The absorption peaks like 690, 3050, 1600 cm^{-1} for styrene and the peaks at 1560 and 1265 cm^{-1} are corresponds to the diazonium linkage indicating effective functionalization. Thermal analysis shows around 80 % weight loss in functionalized CNT in comparison to the 20 % weight loss in pure CNT. The modified CNT is highly soluble in all most all non polar solvents and polar solvents like tetrahydrofuran and dimethylformamide. Further the modified CNT was polymerized in abundant of Styrene to form polystyrene-CNT nanocomposite. The polymer was characterized through ^1H NMR, FT-IR, Raman and SEM