

Study on the Formation of Carbon Nanotube Sheets using Low Molecular Liquid Crystals

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We report first method for the preparation of 2D single-walled carbon nanotubes (SWNTs) structures using smectic LCs, 4' hexyloxy-biphenyl-4-carboxylic acid ethyl ester. SWNT sheets were simply prepared via π - π stacking between small molecular liquid crystal exhibiting lamella structure at room temperature and SWNTs walls. The small molecular liquid crystal was found to be a self-organizing template for the formation of the 2D nanostructure. Differential scanning calorimetry (DSC), polarized optical microscopy (POM), X-ray diffraction (XRD) and scanning electron microscopy were used to characterize and confirm SWNT sheets.