Supporting Information

Functionalization of Multi-Walled Carbon Nanotubes with Thermotropic Liquid-crystalline Polymer and its Composite

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Figure S1. FTIR spectra of (a) 1,6-hexylene bis(4-hydroxybenzoates) and (b) the liquid-crystalline polyester.

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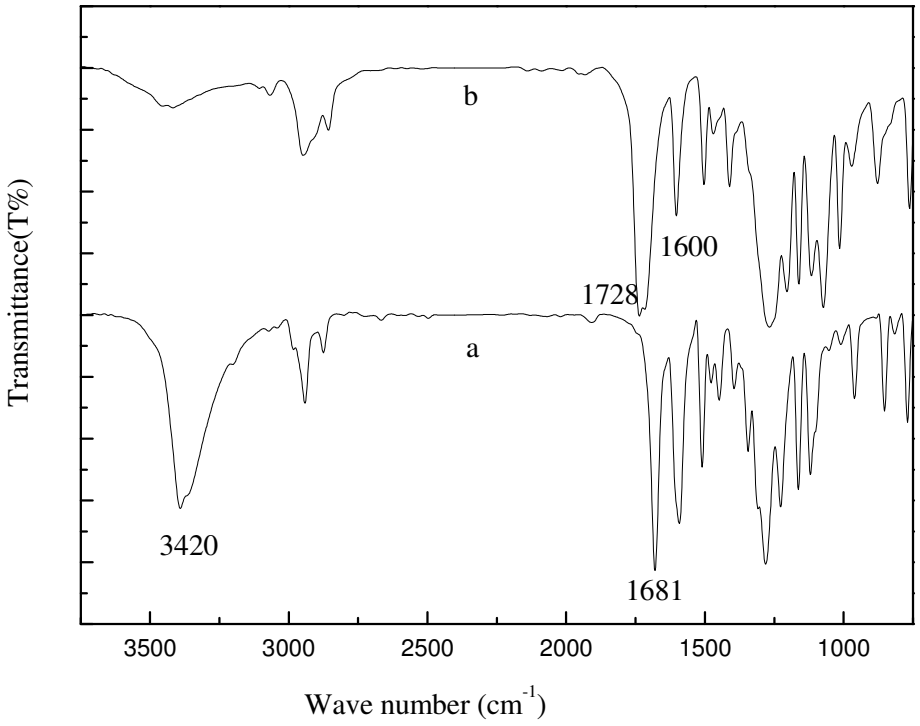
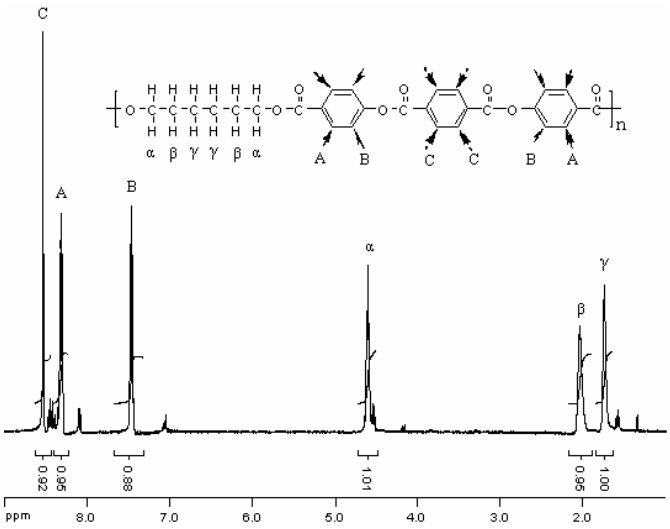


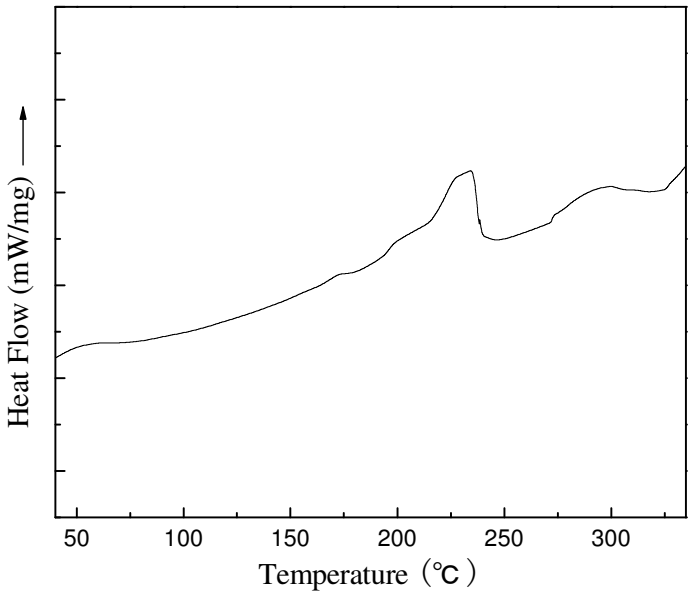
FTIR spectra shown in Figure S1 confirm the process of polycondensation, as evidenced by the blue shift of C=O stretching (from 1681 to 1728 cm^{-1}) and the drastically decreased intensity at a wave number of about 3420 cm^{-1}, which is assigned to O-H stretching. At the same time, the characteristic absorptions of the liquid-crystalline polyester can be distinctly observed (Figure S1b), such as C-H stretching from alkyl chains at 2857 and 2946 cm^{-1}, benzene ring C–C stretching at 1600 cm^{-1}, benzene ring C–H in-plane bending at 1502 cm^{-1}, C-O stretching at 1268 cm^{-1}, and benzene ring C–H out-of-plane bending at 761 cm^{-1}.

Figure S2. ^{1}HNMR spectrum of the liquid-crystalline polyester in deuterated trifuoroacetic acid



Due to highly stiff main chain, the obtained polymer was insoluble in various organic solvents such as chloroform, THF, 1,4-dioxane, DMF, etc.. It is, however, completely soluble in trifuoroacetic acid. Careful ^{1}HNMR analysis, shown in Figure S2 was carried out for the liquid-crystalline polyester in order to prove the chemical structure of the polymer. The polymer gives satisfactory spectroscopic data corresponding to its expected molecular structure.

Figure S3. DSC curves of the liquid-crystalline polyester.



Phase behavior of the polymer is studied by DSC, as shown in Figure S3. Two separated endothermic transition regions are observed. The major endothermic transition at 234□ is contributed to transition melting T_m and corresponding enthalpy ΔH_m is 33.0 J/g. The isotropization transition T_i, occurs around 290□ and corresponding enthalpy ΔH_i is 8.0 J/g.

Figure S4. POM micrograph of the liquid-crystalline polyester at ×400 magnification, showing the formation of nematic mesophase, i.e., threaded schlieren texture.