

SUPPLEMENTARY INFORMATION

Covalent Functionalization of MWCNTs with Poly(p-phenylene sulphide) Oligomers: A Route Towards the Efficient Integration through a Chemical Approach

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Table S1. Summary table of diverse mechanical properties in CNT/PPS nanocomposites found in literature

Type of CNTs	CNT loading (wt%)	dY/dV (GPa)	dσ/dV (GPa)	dE'/dV (GPa)	Reference
SWCNTs	2	233	1.0	333	19
	2 (wrapped)	517	6.3	500	
	~9 (anchored)			185	23
MWCNTs	7	3684	27.2		12
	7	783	51.4		16
	8	1211	10.0		14
	~8.5 (wrapped)			58	20
	15			0.6	13

NOTE: The mechanical parameters are normalized to the volume fraction (V) of the filler inside the PPS matrix, as proposed by Coleman and co-workers (Ref. 5). For this purpose, the density values for CNTs have been taken as 1.8 g/cm³ in MWCNTs,* and 0.14 g/cm³ in SWCNTs,** in order to estimate the CNTs volume fraction. The PPS matrix density was assumed to be 2.1 g/cm³ *. The properties notations are: Y = Young's modulus; σ = Tensile strength; E' = Storage modulus (at 25°C and 1Hz, except for reference 20, where it has been taken at 40°C).

* Reference 12

** <http://www.cheaptubesinc.com/swnts.htm>

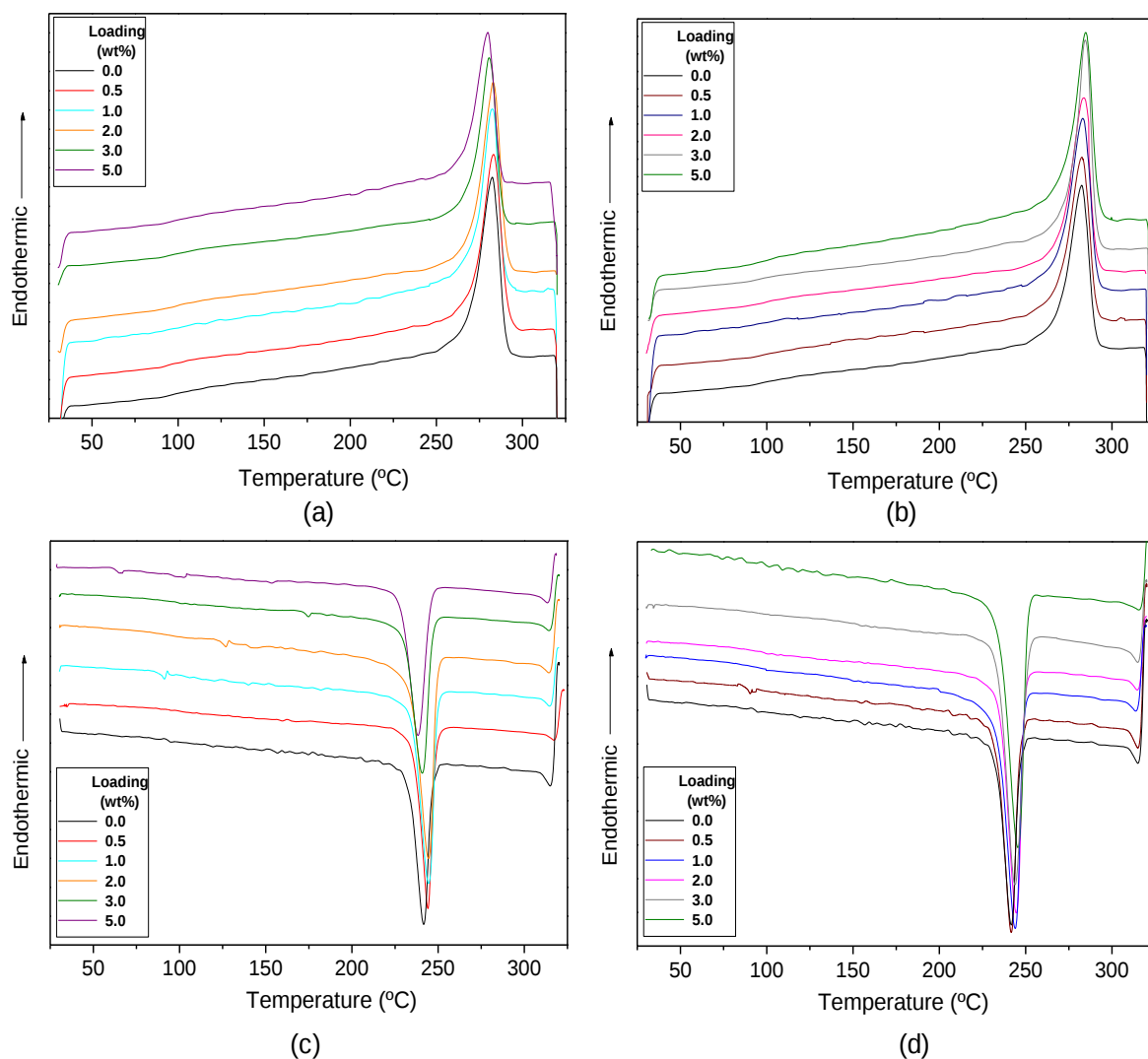
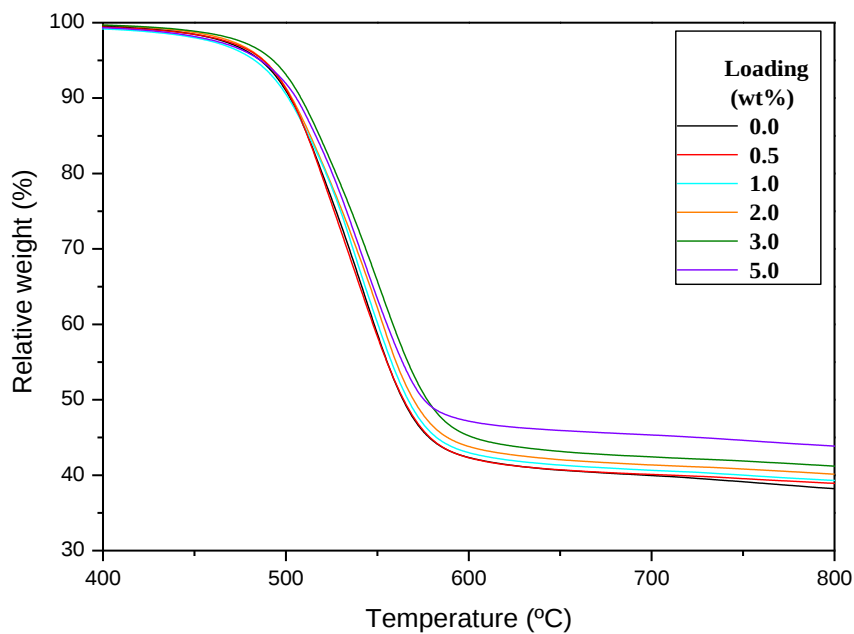
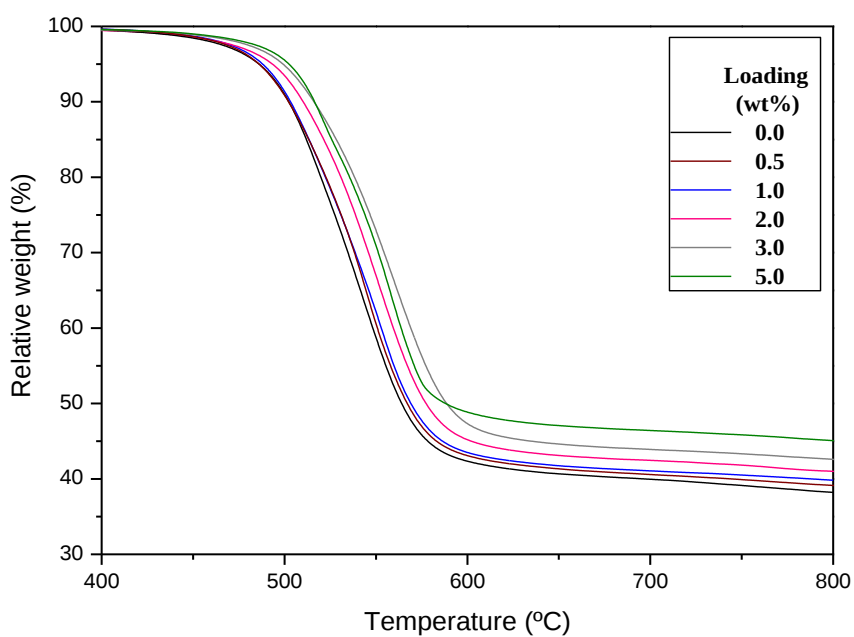


Figure S1. DSC heating and cooling thermograms (N_2 flow at 60 mL/min, scan rate = $10^\circ\text{C}/\text{min}$) for MWCNT/PPS nanocomposites with different MWCNT loadings. (a) and (c) correspond to pristine Nanocyl MWCNTs, while (b) and (d) to oligomer-grafted Nanocyl MWCNTs in the one-pot reaction.



(a)



(b)

Figure S2. TGA data (under N_2 flow at 50 mL/min, heating rate = 10°C/min) of PPS/MWCNT nanocomposites with different MWCNT loadings. (a) Pristine Nanocyl MWCNTs; (b) oligomer-grafted Nanocyl MWCNTs. For comparison purposes, only the temperature range between 400 and 800 °C is plotted.