

Supplementary Information

Amphiphilic Poly(N-vinyl Pyrrolidone) Grafted Graphene by Reversible Addition and Fragmentation Polymerization: Reinforcement of Poly(vinyl acetate) Films

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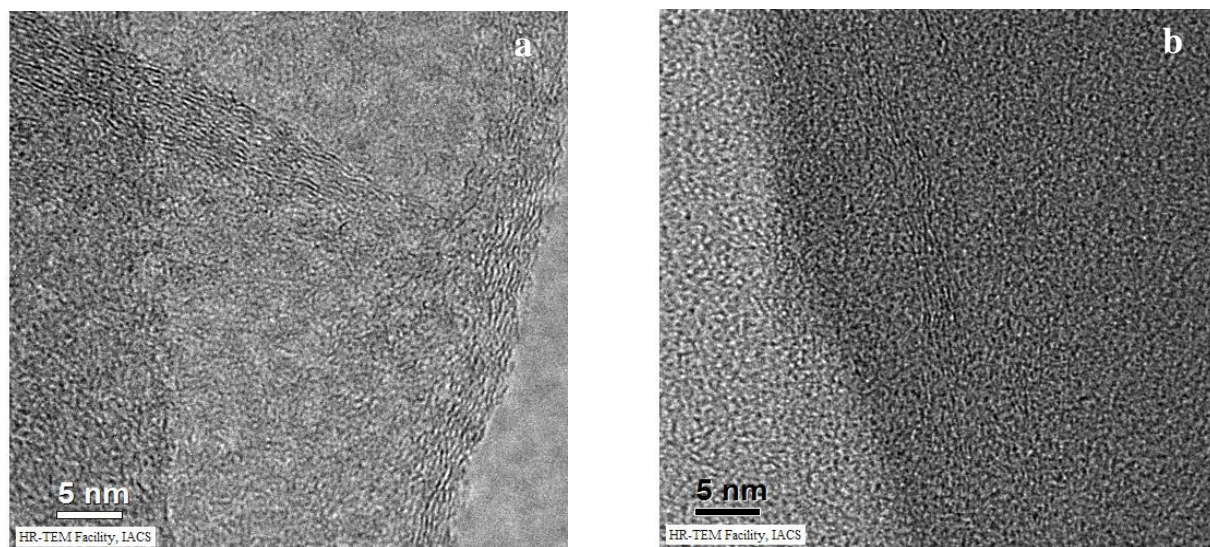
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SI Table 1. Hansen solubility parameters of different solvents

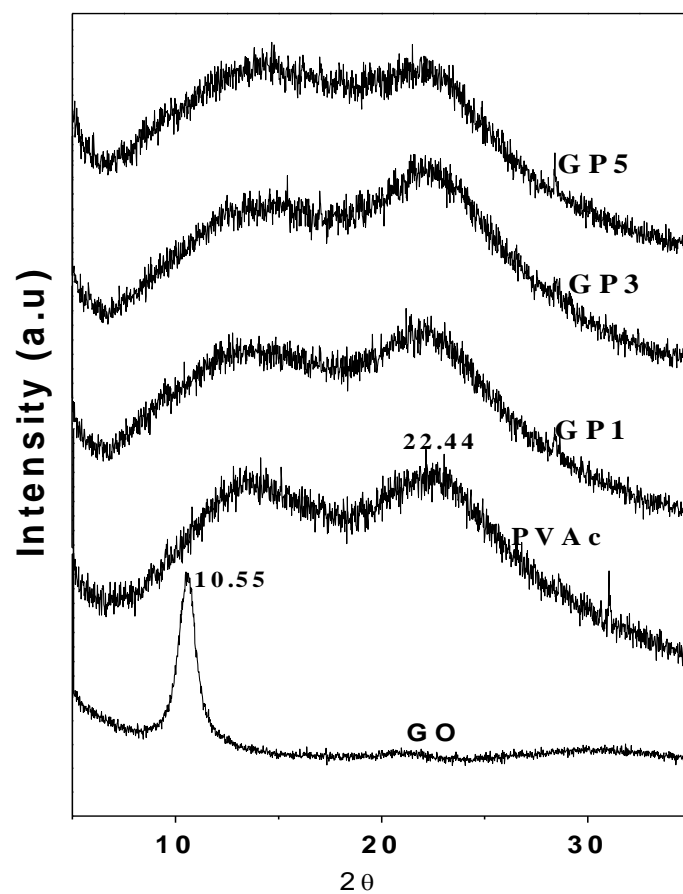
Solvent	δ_P	δ_H	$\delta_P + \delta_H$
Hexane	0	0	0
Petroleum ether	0	0	0
CCl₄	0	0.6	0.6
Benzene	0	2.0	2.0
Toluene	1.4	2.0	3.4
Xylene	1	3.1	4.2
Chlorobenzene	4.3	2.0	6.3
Diethyl ether	2.9	5.1	8.0
CHCl₃	3.1	5.7	8.8
1,4-dioxane	1.8	7.4	9.2
Dichlorobenzene	6.3	3.3	9.6
DCM	6.3	6.1	12.4
Ethyl acetate	5.3	7.2	12.5
THF	5.7	8	13.7
Acetone	10.4	7	17.4
NMP	12.3	7.2	19.5
CH₃CN	18.0	6.1	24.1
DMF	13.7	11.3	25
DMSO	16.4	10.2	26.6
Ethanol	8.8	19.4	28.2
Methanol	12.3	22.3	34.6
Water	16.0	42.3	58.3

SI Table-2. Mechanical properties (stress, strain, modulus and toughness) of PVAc and PVAc / GP nanocomposites at 30⁰C

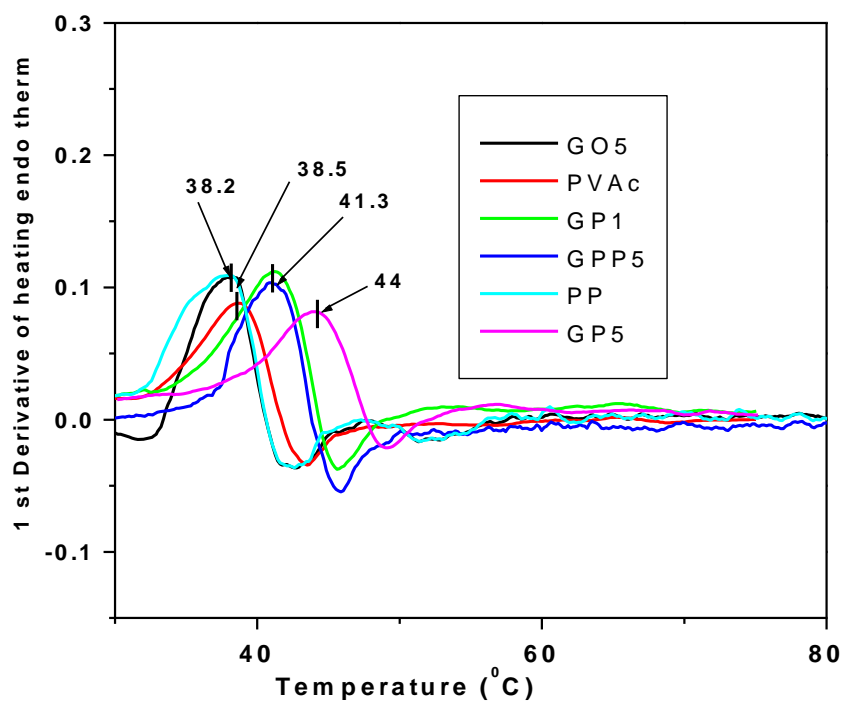
Sample	Strain % at break	Stress at break (MPa)	% Increase of stress at break	Young's modulus (GPa)	% Increase of Young's modulus	Toughness (Nmm)	% increase of toughness
PVAc	518 ±7.5	7 ±0.3	-	1.47±0.07	-	241.2±10.5	
GP1	506.6 ±6.1	13.1 ±.2	62	2.7±0.1	63	461.6±12.8	91
GP3	474 ±5.7	16.9 ±0.7	126	3.1±0.1	107	511.9±8.6	112
GP5	385.5±5.6	18.8 ±1.2	169	4.2±0.09	180	449±9.5	86



SI Fig.1 HRTEM images of (a) GO and (b) GP



SI Figure 2. WAXS pattern of GO, PVAc and its nanocomposite with GP at indicated composition



SI Figure 3. 1st derivative of DSC heating endotherm to obtain glass transition temperature