

Supplementary Information

Preparation and comparison of reduced graphene oxide and carbon nanotubes as fillers in conductive natural rubber for flexible electronics

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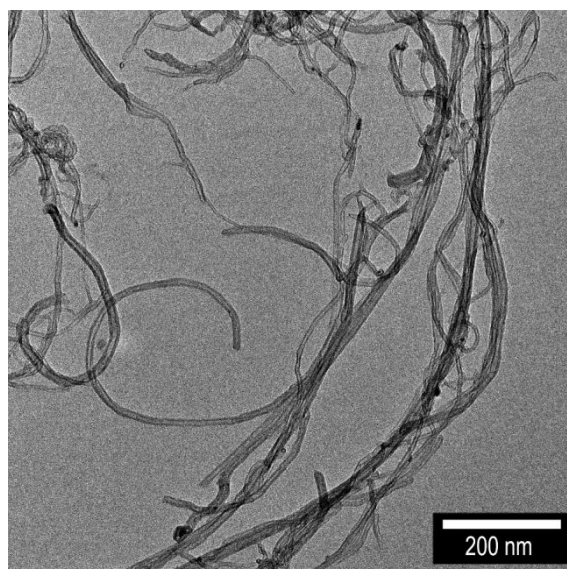


Figure S1: TEM of the MWCNT utilized for the preparation of the NR conductive composites.

Table S1. Assignment and relative percentage of the functionalities arising from the deconvolution of the C 1s XPS spectra: graphene oxide (GO1), thermally reduced at 150°C × 1 h under vacuum (GO2), thermally reduced GO at 1000°C × 5 s (GO3), chemically reduced GO using NaBH₄ + Ammonia (GO4), and chemically reduced GO using NaBH₄ + NaOH (GO5) samples determined by XPS.

Sample	Peak BE (eV)	%	Functionalities
GO1	284.5	48.7	C–C and C=C
	285.8	6.62	C–OH
	286.7	37.33	C–O–C
	287.7	7.35	C=O
GO2	284.6	16.45	C–C and C=C
	286.9	58.45	C–O–C
	288.4	17.9	C=O
	290.4	7.2	N.D.
GO3	284.6	59.65	C–C and C=C
	285.4	16.45	C–OH
	286.3	13.7	C–O–C
	288.1	10.2	C=O
GO4	284.6	61.1	C–C and C=C
	285.5	17.7	C–OH
	286.5	11.45	C–O–C
	287.9	9.75	C=O
GO5	284.6	58.19	C–C (sp ²)
	285.6	22.09	C–C (sp ³)
	287.0	12.80	C–O
	288.9	6.91	C=O

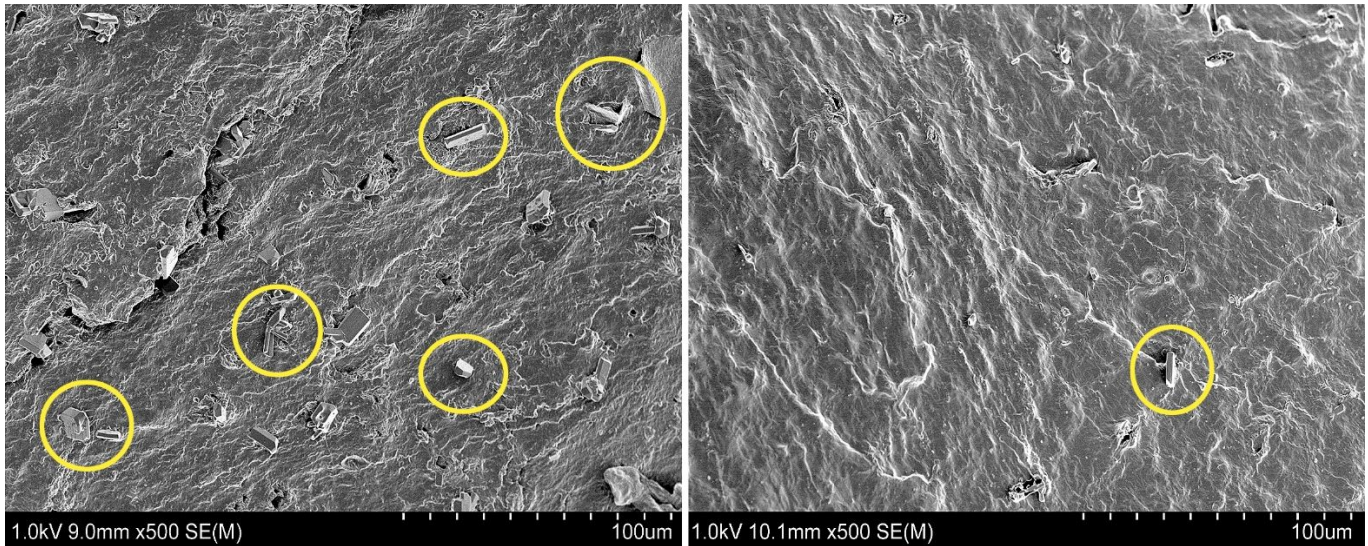


Figure S2: SEM cryogenic surface fracture of the rGO-THF composite (left) and rGO-Toluene (right). Contained within the yellow circles are marked the sulphur crystals remained after vulcanization of the samples

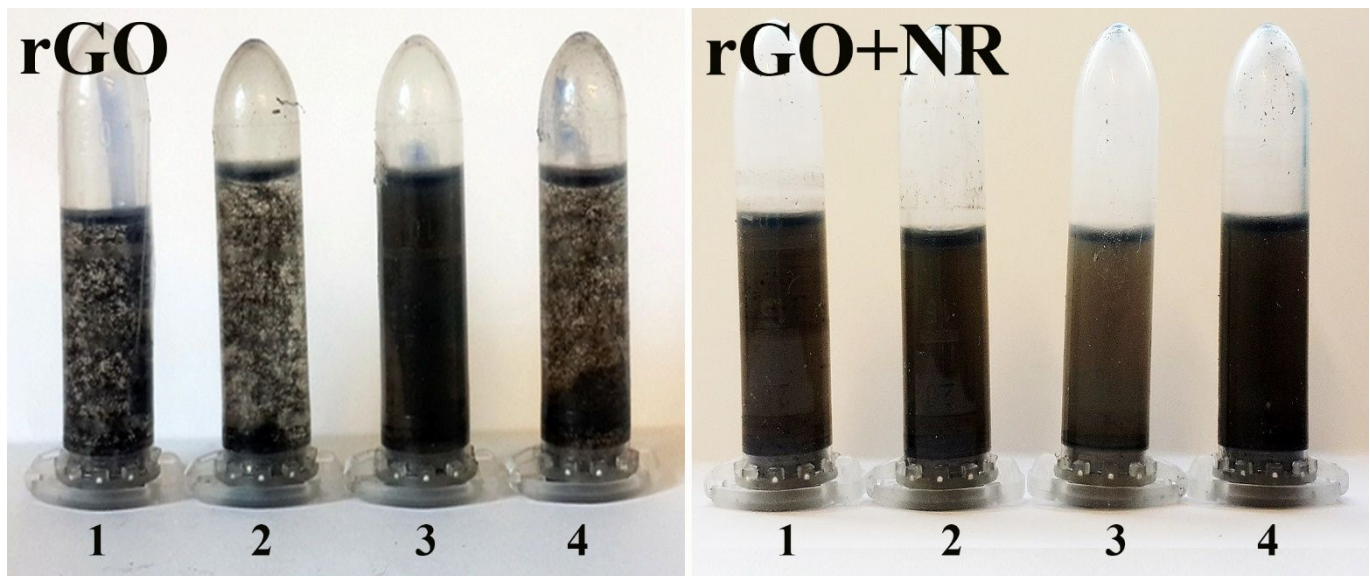


Figure S3: stabilizing effect observed for the rGO dispersion after the addition of 0.1 vol% of NR and 3 months in Chloroform, xylene, THF and toluene, 1-4 respectively.

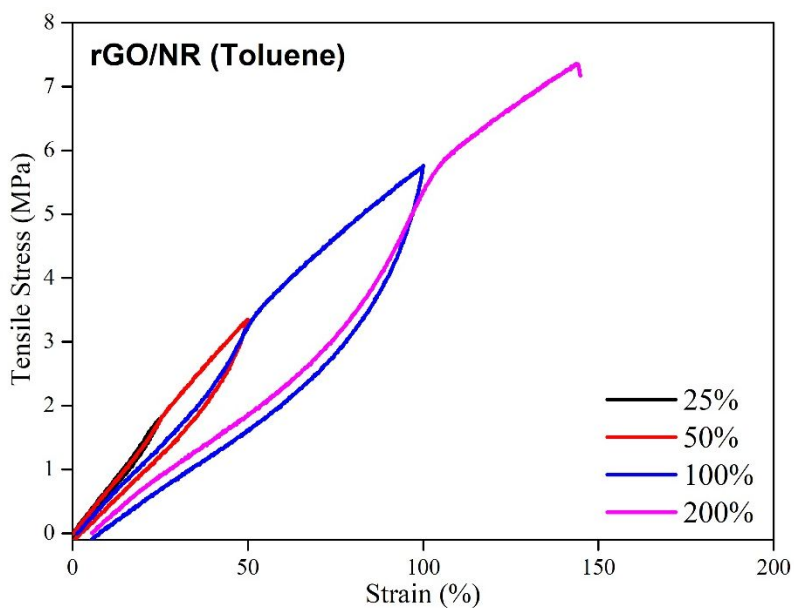


Figure S4: tensile test cycles for NR composite (toluene-based) with 4.4 wt% of the rGO.

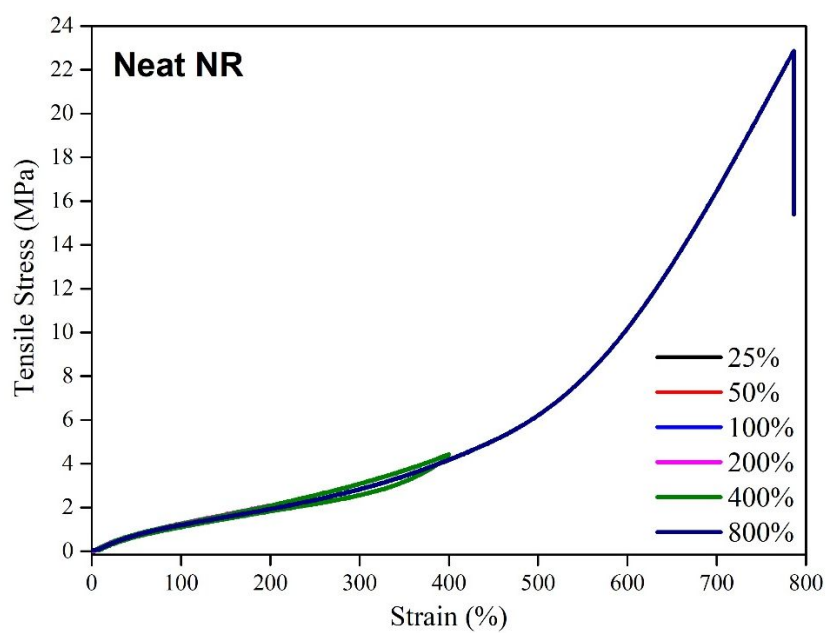


Figure S5: tensile test cycles for the neat NR.

Conflicts of interest

No conflict of interest to declare