Covalently bonded interface for polymer/graphene composites

Supporting information

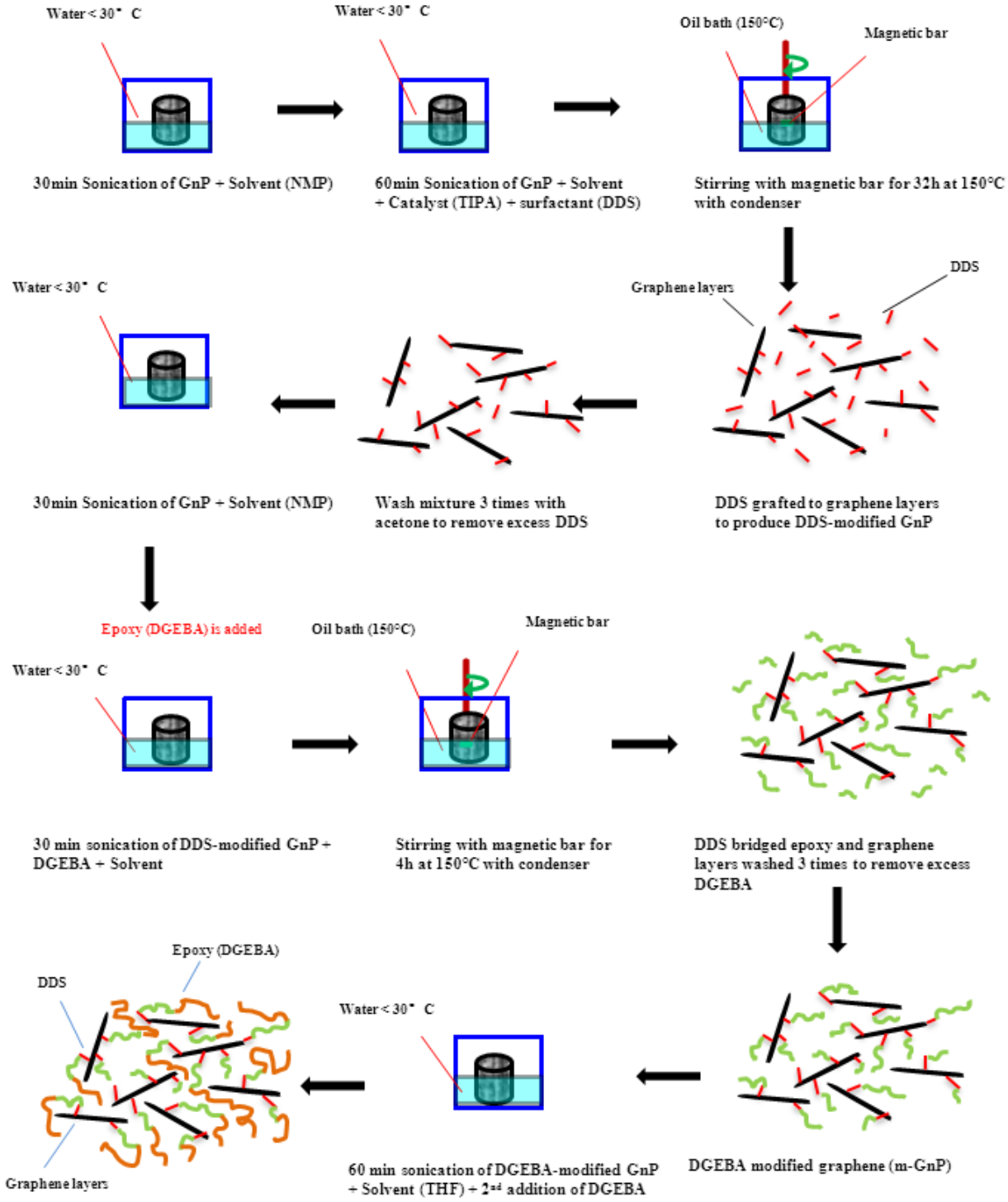

Fig. S1 Schematic of graphene modification.

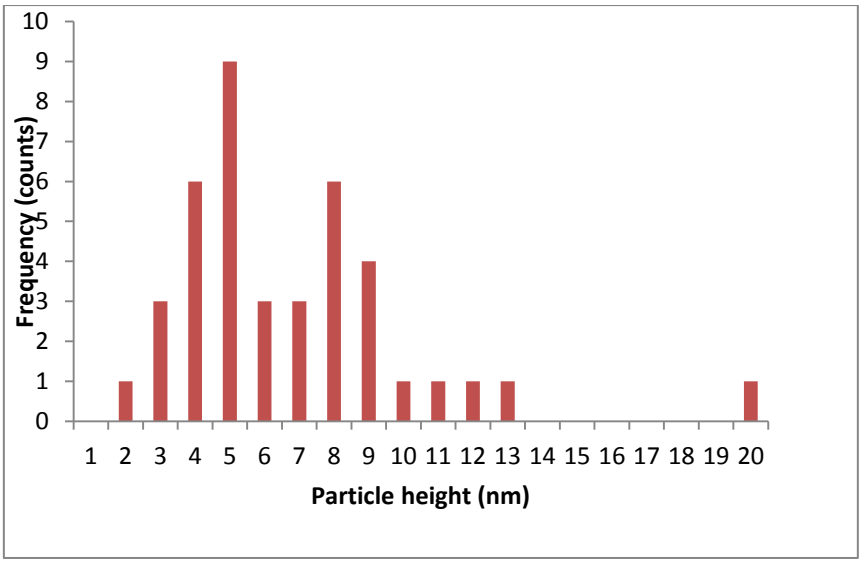

Fig. S2 Thickness measurement of the modified graphene platelets

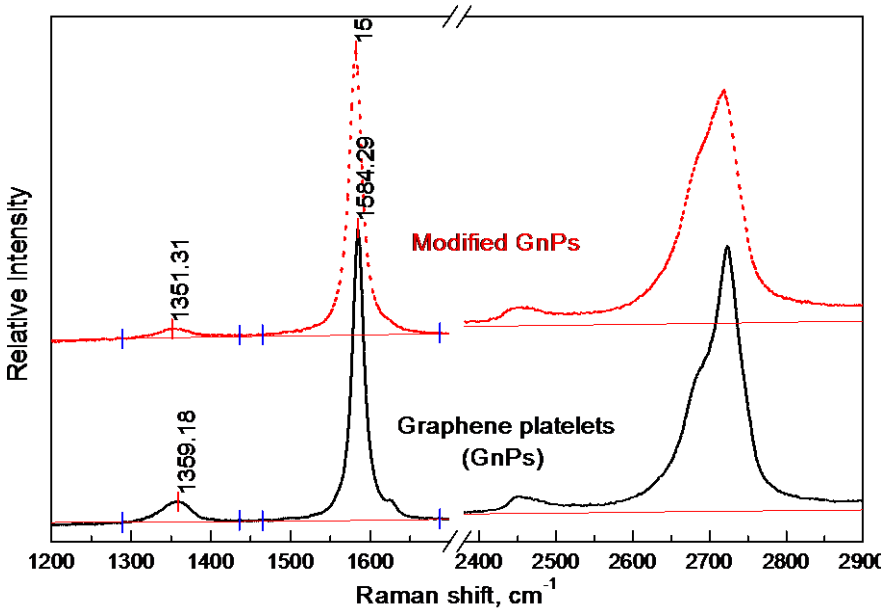

Fig. S3 baselines for measuring the D to G band ratio.

Table S1 Electrical conductivity of epoxy/*m*-GnP nanocomposites

Fraction	Volume resistivity (Ω cm)
Neat epoxy	1.50×10^{16}
Epoxy/*m*-GnP, 0.122 vol%	5.16×10^{15}
Epoxy/*m*-GnP, 0.244 vol%	5.55×10^{12}
Epoxy/*m*-GnP, 0.489 vol%	1.58×10^{10}

Table S2 Electrical conductivity of epoxy/*u*-GnP (unmodified GnP) nanocomposites

Fraction	Volume resistivity (Ω cm)
Neat epoxy	1.02×10^{16}
Epoxy/u-GnP, 0.244 vol%	2.95×10^{17}
Epoxy/u-GnP, 0.489 vol%	3.52×10^{16}

Table S3 Mechanical properties of epoxy/*m*-GnP nanocomposites

Fraction	Tensile strength (MPa)	Young's Modulus (GPa)	Plane-Strain Fracture toughness K_{1c} (MPa·m$^{1/2}$)	Critical strain energy release rate G_{1c} (kJ/m²)
Neat epoxy	52.3±2.3	2.16±0.03	0.653±0.0338	0.176±0.01
Epoxy/*m*-GnP, 0.122 vol%	59.47±1.9	2.89±0.02	1.05±0.0804	0.340±0.03
Epoxy/*m*-GnP, 0.244 vol%	51.51±5.5	3.13±0.28	1.14±0.0386	0.370±0.01
Epoxy/*m*-GnP, 0.489 vol%	46.94±1.9	3.40±0.45	1.41±0.103	0.521±0.05

Table S4 Mechanical properties of epoxy/*u*-GnP nanocomposites

Fraction	Tensile strength (MPa)	Young's Modulus (GPa)	Plane-Strain Fracture toughness K_{1c} (MPa·m$^{1/2}$)	Critical strain energy release rate G_{1c} (kJ/m²)
Neat epoxy	52.3±2.3	2.16±0.03	0.66±0.05	0.179±0.03
Epoxy/u-GnP, 0.244 vol%	49.9 ± 5.7	2.23±0.08	0.82±0.10	0.265±0.06
Epoxy/u-GnP, 0.489 vol%	35.7 ± 3.8	2.25±0.09	0.98±0.08	0.372±0.06