Electronic Supplementary Material (ESI) for Nanoscale.

Supplementary Material

Modified Graphene/Polyimide Composite Films with Strongly Enhanced Thermal Conductivity

Xian Wu, † Haoliang Li, † Kui Cheng , Hanxun Qiu and Junhe Yang *

School of Material Science and Engineering, University of Shanghai for Science and Technology, Shanghai 200093, China

Xian Wu, Haoliang Li, contributed equally to this work.

Corresponding authors: jhyang@usst.edu.cn

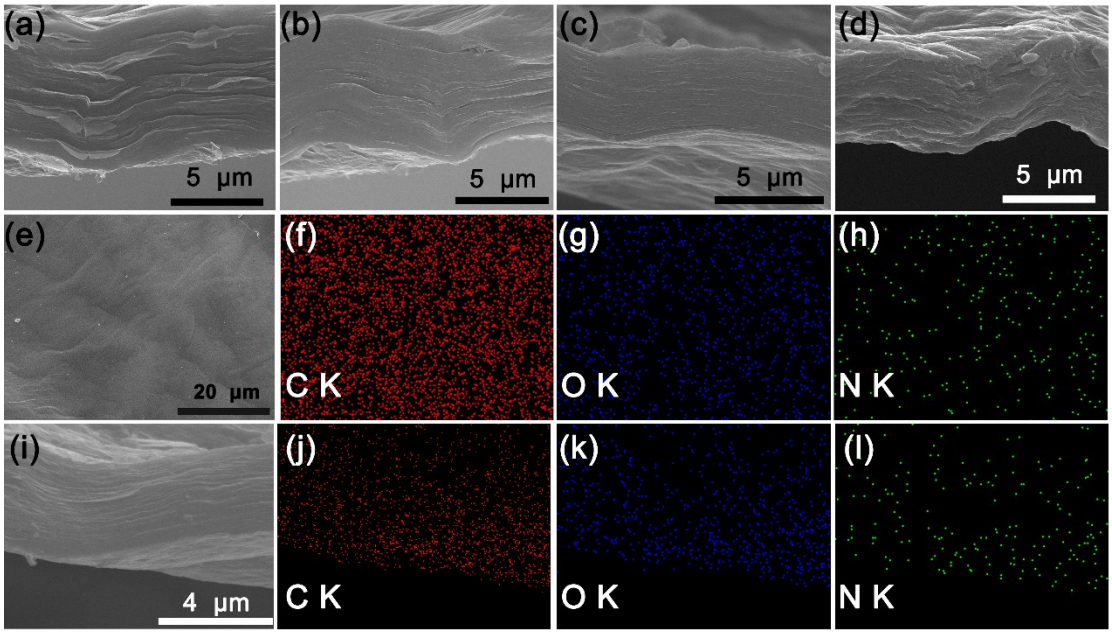

Figure s1. The cross-section morphology (a–d) of mGO/PAA film with 1%, 4%, 7% and 10% addition of PAA, respectively; The surface morphology (e–h) and the cross-section (i-l) of mGO/PAA-7% film and its elements analysis (EDX) mapping.

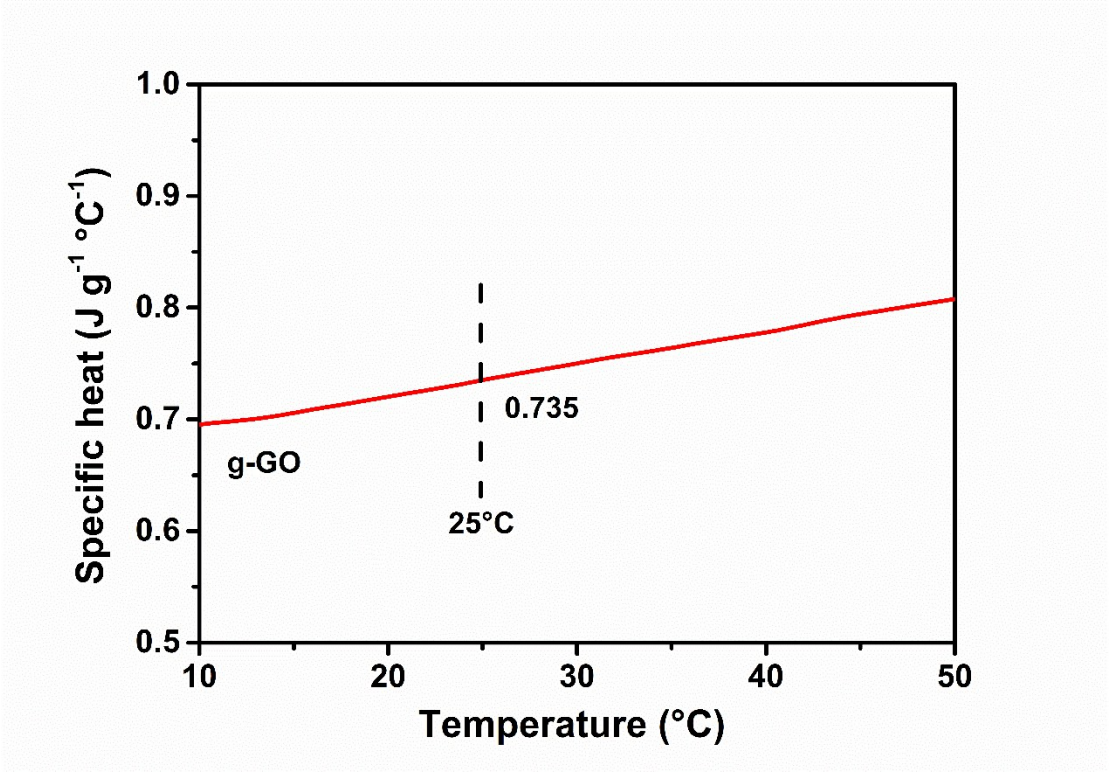

Figure s2. The specific heat capacity (Cp) of g-GO film measured by the differential scanning calorimetry

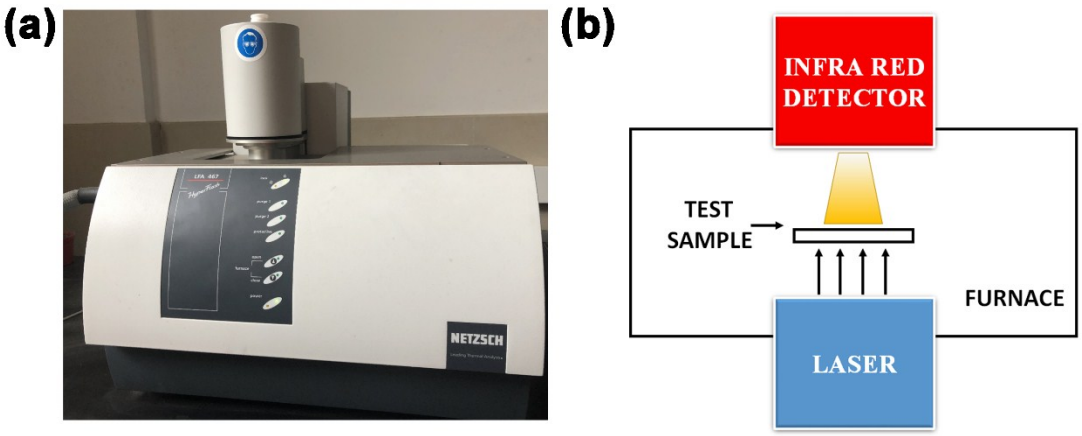

Figure s3. The thermal conductivity of each sample at room temperature is determined by a laser flash analysis (LFA 467 NanoFlash). (a) Laser flash equipment LFA467 used for the measurements (b) Schematic illustration of the LFA467 instrument.

Table s1. The detail information of X−ray diffraction patterns for GO, mGO, mGO/PAA films and the relevant interlayer spacing

Sample	2θ（°）	d（001） (nm)
GO	9.99°	0.884 nm
mGO	9.19°	0.961 nm
mGO/PI-1%	8.91°	0.991 nm
mGO/PI-4%	8.61°	1.025 nm
mGO/PI-7%	8.32°	1.062 nm
mGO/PI-10%	8.38°	1.054 nm

Table s2. The detail information of X−ray diffraction patterns for g-GO, g-mGO, g-mGO/PI films and the relevant interlayer spacing

Sample	2θ（°）	d（002） (nm)
g-GO	26.32°	0.3382 nm
g-mGO	26.33°	0.3381 nm
g-mGO/PI-1%	26.33°	0.3381 nm
g-mGO/PI-4%	26.33°	0.3381 nm
g-mGO/PI-7%	26.39°	0.3368 nm
g-mGO/PI-10%	26.37°	0.3376 nm

Table s3. The I_D/I_G for GO, mGO, mGO/PAA films and films obtained after graphitization treatment.

Sample	I_D/I_G	Sample	I_D/I_G
GO	0.971	g-GO	0.105
mGO	0.984	g-mGO	0.0838
mGO/PI-1%	0.924	g-mGO-PI-1%	0.0836
mGO/PI-4%	0.981	g-mGO-PI-4%	0.0528
mGO/PI-7%	0.985	g-mGO-PI-7%	0.0498
mGO/PI-10%	0.934	g-mGO-PI-10%	0.1250

Table s4. The detail information of thickness and bulk density of g-GO, g-mGO, g-mGO/PI films

Sample	thickness (μ m)	ρ (g/cm^3)
g-GO	2	1.974
g-mGO	2	1.820
g-mGO/PI-1%	2	1.875
g-mGO/PI-4%	2	1.883
g-mGO/PI-7%	2	2.080
g-mGO/PI-10%	3	1.906

Table s5. Recent works about thermal performance of carbon-based related materials

Materials	Thermal conductivity($Wm^{-1}K^{-1}$)	Ref
Large area freestanding graphene papers	1434	1
CNR/graphene hybrid paper	890	2
Graphene/Carbon fiber composite materials	977	3
Reduced GO/CNT fiber composite sink	1991	4
Ball-milling exfoliated graphene	1529	5
Thermal reduced GO films	1100	6
HI reduced GO films	1390	7
Reduce GO films	1043.5	8

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