

Supplementary Material

## Enhancement of thermal conductivity in polyamide-6/graphene composites via “Bridge Effect” of silicon carbide whiskers

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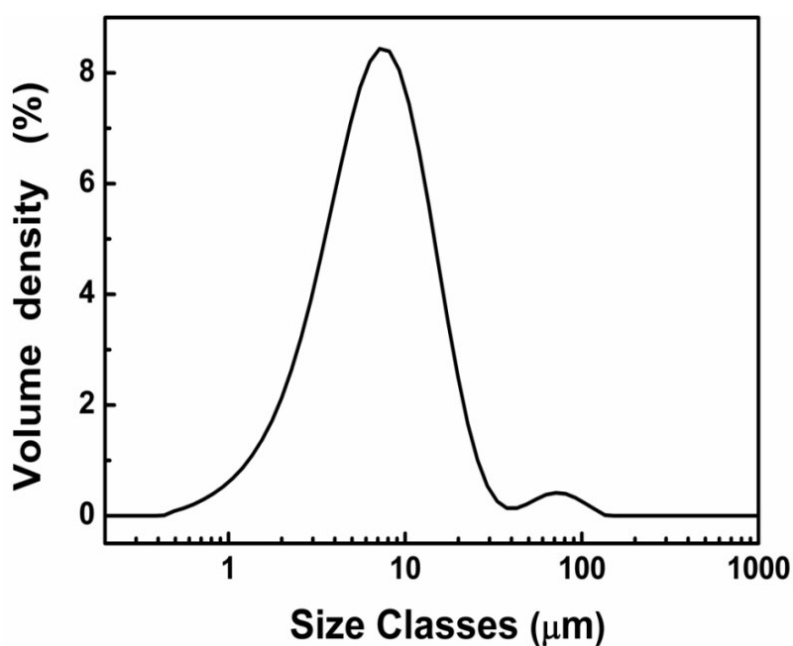


Fig. S1 The particle size distribution of the graphene nanosheets

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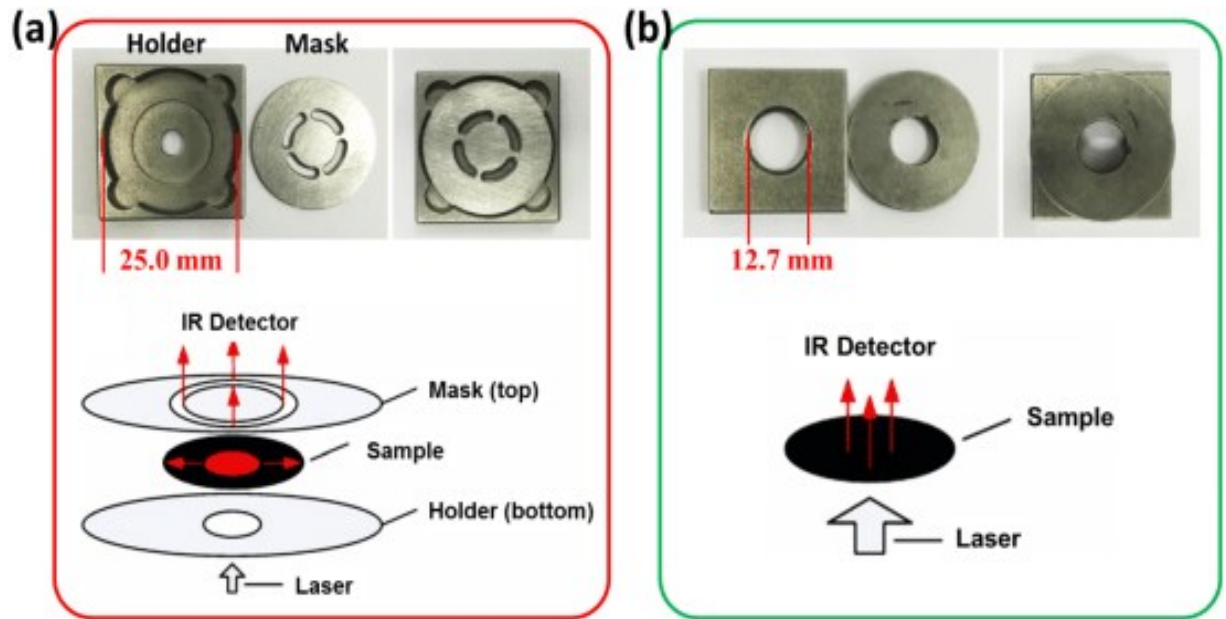


Fig. S2 The test model of TC (a)  $\lambda_x$  test model; (b)  $\lambda_z$  test model.

Table S1 The TC of the PG composites

Substance	$\lambda_x$ ( $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ )	Standard deviation	$\lambda_z$ ( $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ )	Standard deviation
PA	2.98	0.084	0.38	0.0201
PG-0.1	3.84	0.093	0.46	0.0273
PG-0.5	6.92	0.105	0.49	0.0206
PG-1	7.108	0.131	0.47	0.0176
PG-2	7.109	0.088	0.52	0.0085
PG-3	7.81	0.130	0.55	0.0308

Table S2 The TC of the PASC composites

Substance	$\lambda_x$ ( $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ )	Standard deviation	$\lambda_z$ ( $\text{W}\cdot\text{m}^{-1}\cdot\text{K}^{-1}$ )	Standard deviation
PASC-0	7.55	0.149	1.38	0.067
PASC-24	7.49	0.085	1.55	0.164
PASC-8	7.80	0.044	1.85	0.071

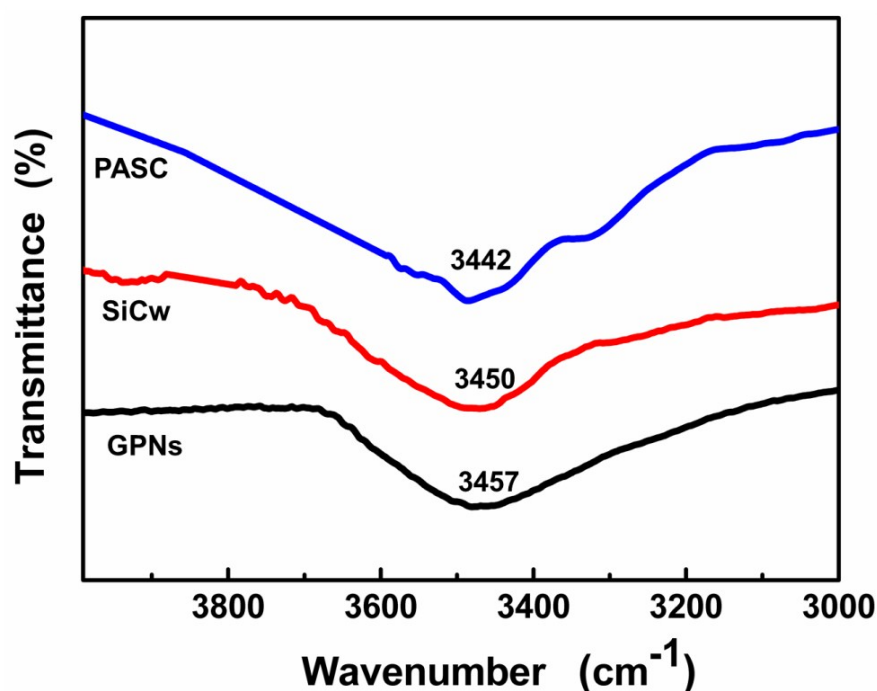


Fig. S3 FTIR spectra of the graphene nanosheets, SiCw and PASC composites at wavenumbers 3100–3500cm<sup>-1</sup> showing the vibration of –OH groups.

From the FTIR spectra, there is a wide and blunt peak in the 3400 cm<sup>-1</sup> around, which is caused by H<sub>2</sub>O or hydrogen bonds formed by the hydroxyl groups that are associated with each other<sup>1, 2</sup>. In this work, we dried the test sample with a dryer for a long time to prevent the interference of water on the test. In conclusion, the Graphene nanosheets and SiC whiskers may formed intermolecular hydrogen bonds in the PASC composites, the combination of the two fillers will be more closely.

### Supplementing References

1. C. L. Bao, Y. Q. Guo, L. Song and Y. Hu, *Journal of Materials Chemistry*, 2011, **21**, 13942-13950.
2. Y. Chen, X. Zhang, P. Yu and Y. W. Ma, *Chemical Communications*, 2009, DOI: 10.1039/b907723e, 4527-4529.