Electronic Supplementary Material (ESI) for RSC Advances.


# Supplementary Information

## Efficient interfacial interaction for improving mechanical properties of polydimethylsiloxane nanocomposites filled with low content of graphene oxide nanoribbons

Neng-Jian Huang,[a] Jing Zang,[a] Guo-Dong Zhang,[a*] Li-Zhi Guan,[a] Shi-Neng Li,[ab] Li Zhao,[a] Long-Cheng Tang [a*]

[a] *Key Laboratory of Organosilicon Chemistry and Material Technology of Ministry of Education, College of Material, Chemistry and Chemical Engineering, Hangzhou Normal University, Hangzhou 311121, PR China*

[b] Institute for Advanced Ceramics, State Key Laboratory of Urban Water Resource and Environment, Harbin Institute of Technology, Harbin 150001, PR China

*E-mails: zhangguodong@hznu.edu.cn (G.D. Zhang), lctang@hznu.edu.cn (L.C. Tang)

**Fig. S1** Schematic of the fabrication process for H-t-PDMS/GONR composites (The black tensile and tear samples were prepared and shown in figure).

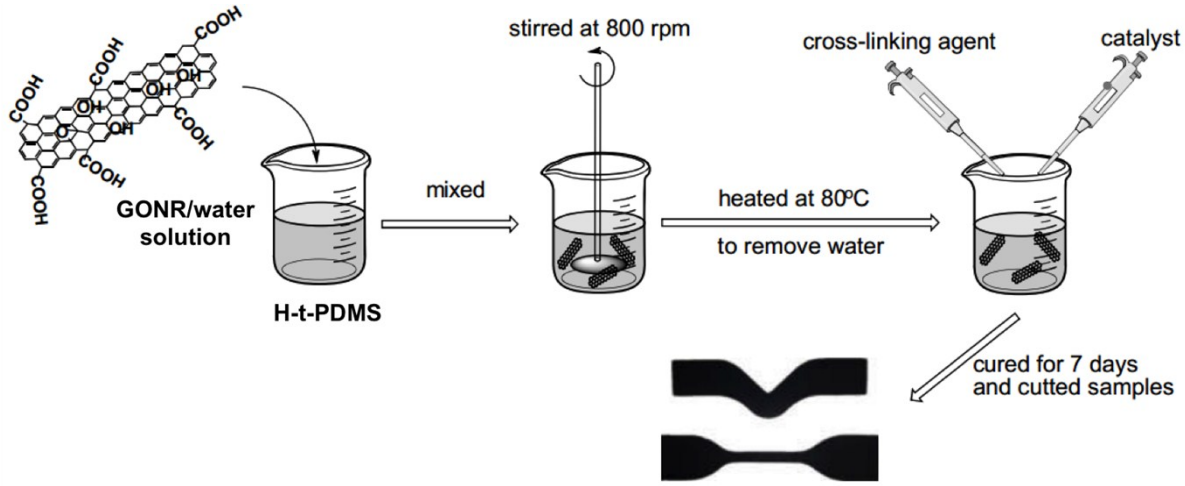


**Fig. S2** The dispersion stability of various carbon nanofillers (CNT, f-CNT and GONR) in aqueous solution.

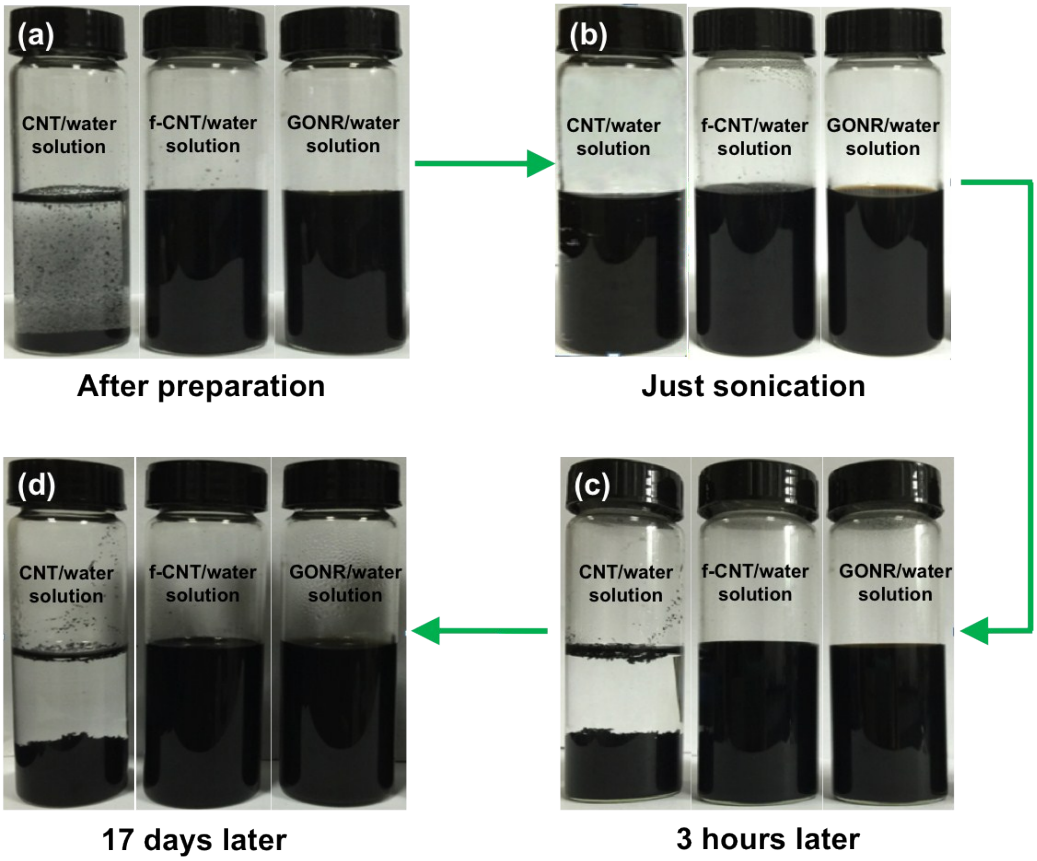

**Fig. S3** TEM images of (a, b) f-CNT at different magnification.

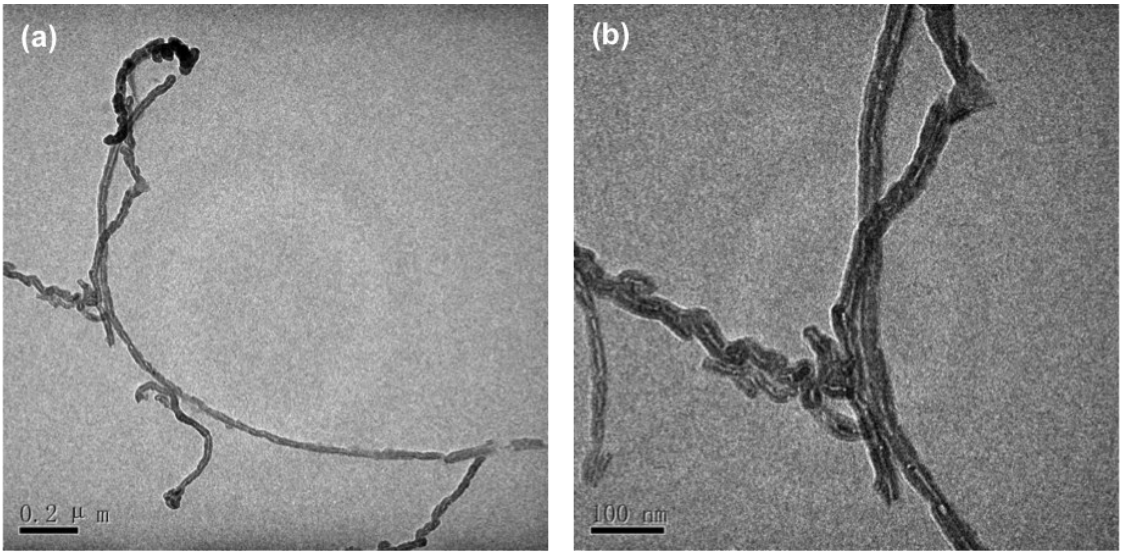


**Fig. S4** SEM images of tensile fracture surface of pure H-t-PDMS at different magnification.

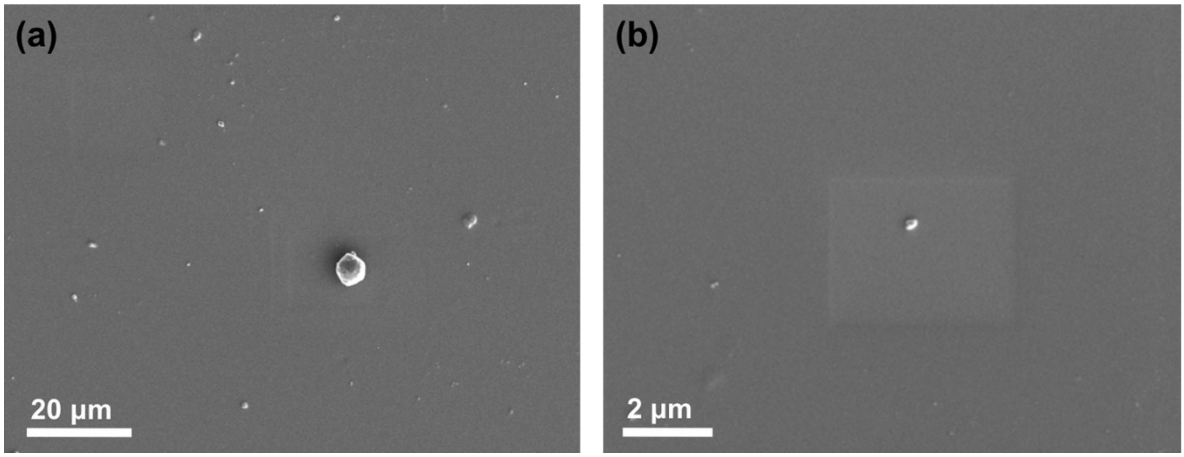

**Fig. S5** Typical tensile stress-strain curves of pure H-t-PDMS and H-t-PDMS composites filled with 0.5 wt% CNT, f-CNT and GONR.

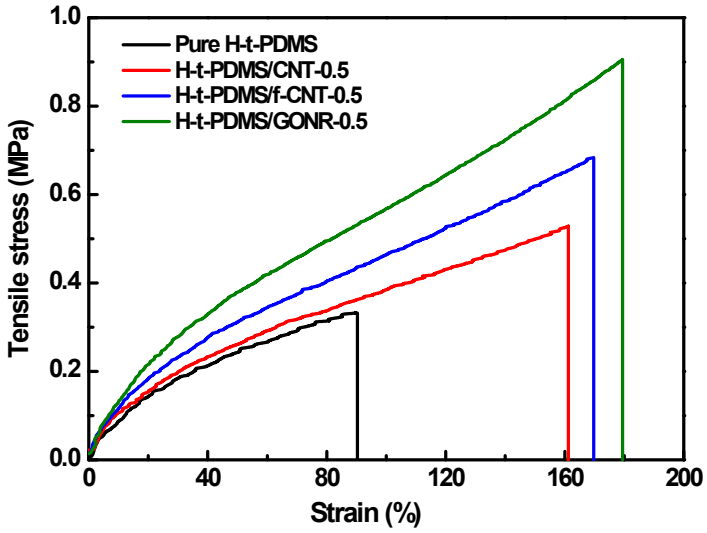


**Fig. S6** SEM images of tensile fracture surface at different magnification of H-t-PDMS composites filled with 0.5 wt% (a, b) CNT and (c, d) f-CNT. (The black arrows indicate the nanotubes in the polymer matrix.)

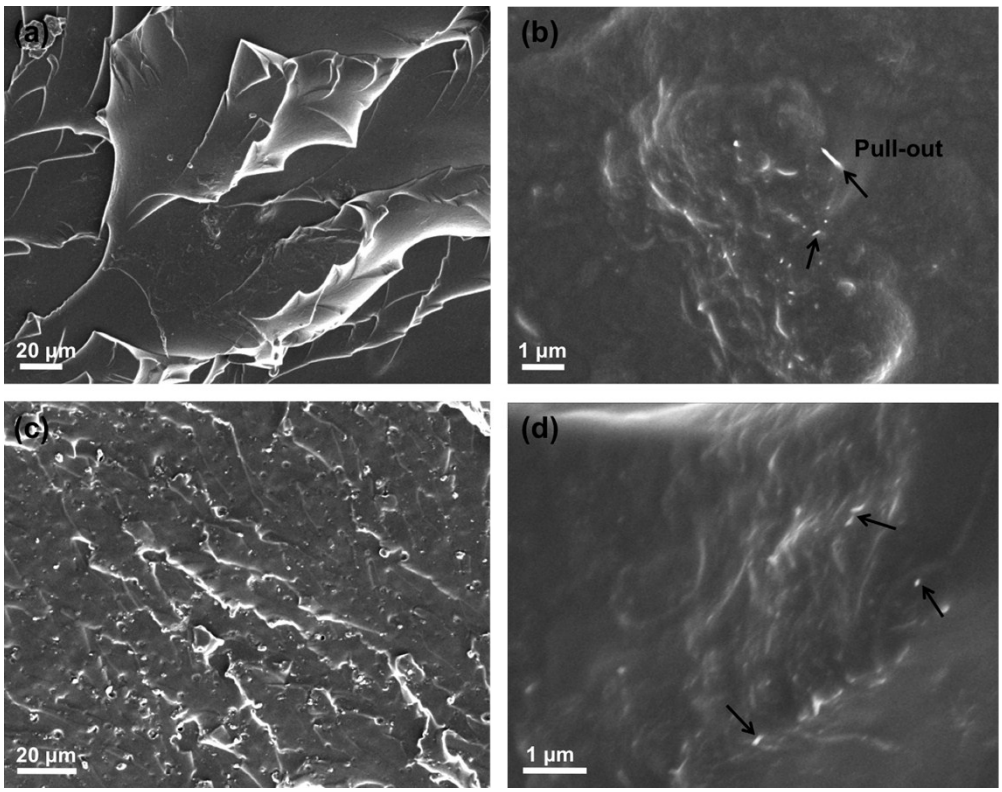

**Table S1.** Tensile strength, Young's modulus and elongation at break of pure H-t-PDMS and H-t-PDMS/GONR composites filled with different GONR contents.

| **Sample Code** | ***E*** **[MPa]** | $\sigma_b$ **[MPa]** | $\varepsilon$ **[%]** |
|---|---|---|---|
| Pure H-t-PDMS | 0.98±0.06 | 0.350±0.015 | 90.28±13.77 |
| H-t-PDMS/GONR-0.05 | 1.22±0.10 | 0.413±0.025 | 96.80±11.46 |
| H-t-PDMS/GONR-0.1 | 1.25±0.07 | 0.504±0.053 | 127.19±15.38 |
| H-t-PDMS/GONR-0.3 | 1.36±0.05 | 0.615±0.046 | 135.07±11.42 |
| H-t-PDMS/GONR-0.5 | 1.93±0.14 | 0.902±0.050 | 179.42±22.43 |
| H-t-PDMS/GONR-0.7 | 1.56±0.09 | 0.744±0.047 | 153.63±18.69 |
| H-t-PDMS/GONR-1.0 | 1.24±0.12 | 0.545±0.056 | 116.94±20.75 |