Electronic Supplementary Material (ESI) for RSC Advances.

The Effect of Graphene-Nanoplatelet on Gelation and Structural Integrity of Polyvinyltrimethoxysilane-Based Aerogel

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Supporting information

XPS Characterization:

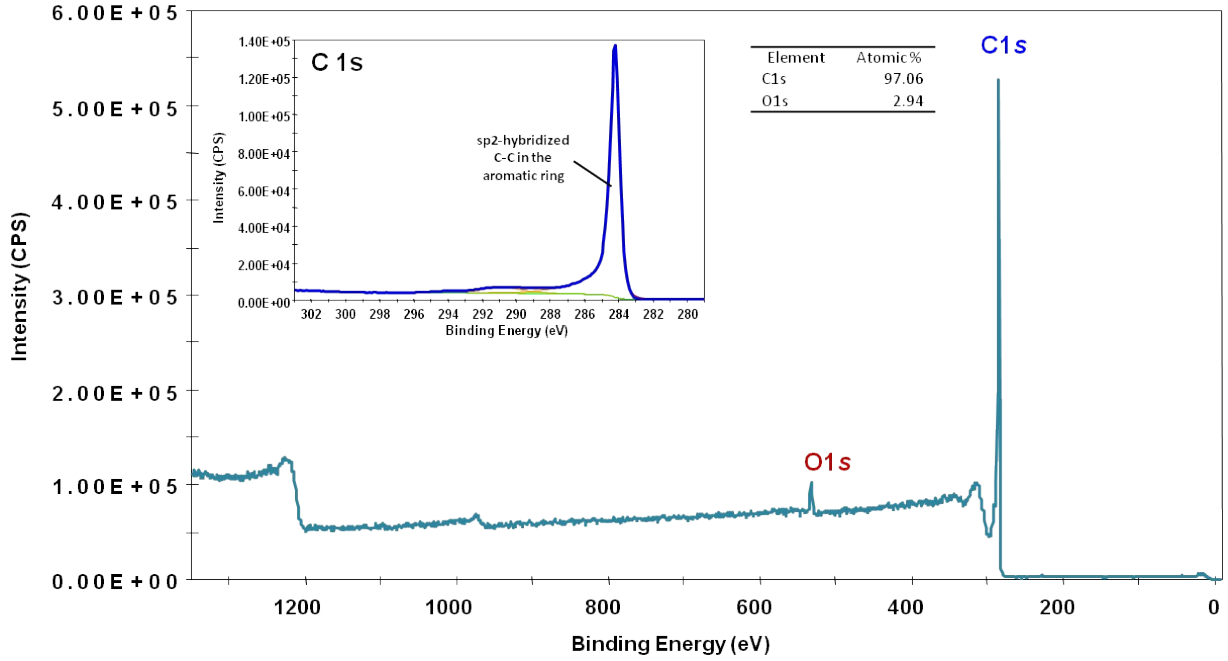
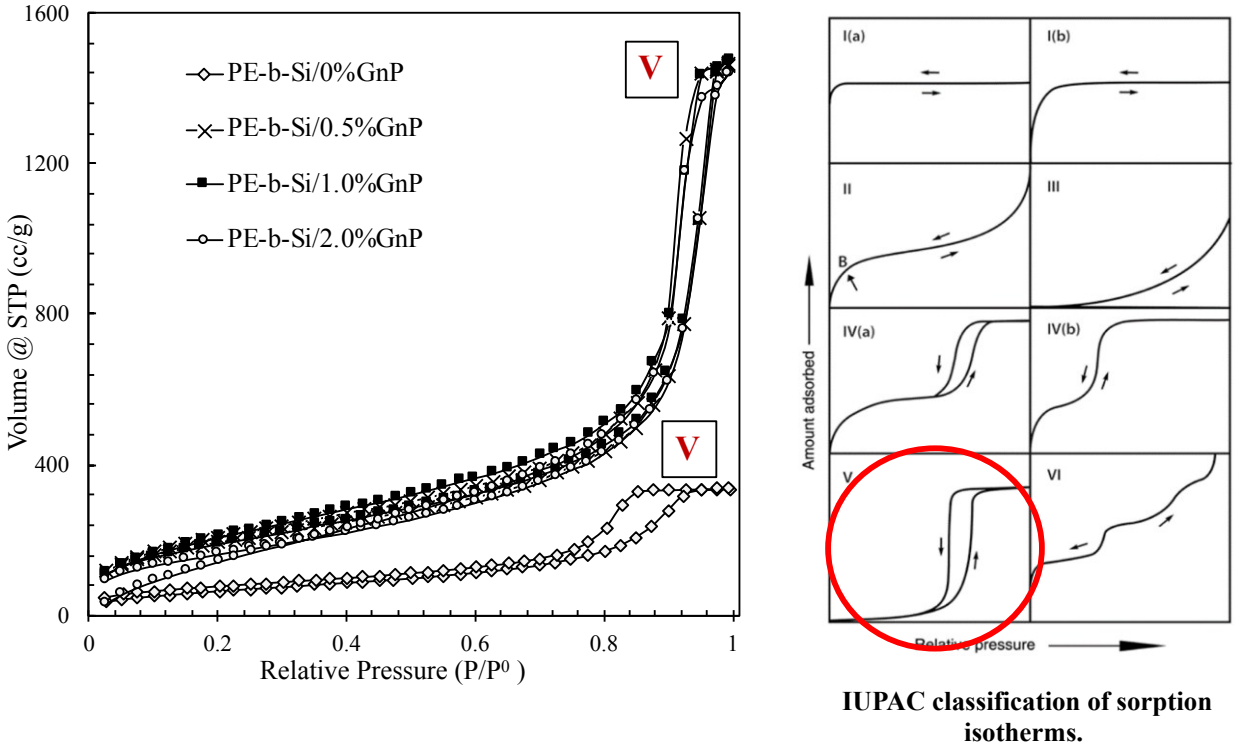


Figure S1. Survey XPS spectrum and C 1s core-level spectrum (decomposed by Lorentzian-Gaussian fitting) for the pristine graphene sample

Pore size and surface characterization:

In the low p/p^0 range, the Type V isotherm shape is very similar to our results for samples with and without GnP. The type V isotherms show pore condensation and hysteresis which is attributed to relatively weak adsorbent–adsorbate interactions.



IUPAC classification of sorption isotherms.

Figure S2. Nitrogen adsorption/desorption analysis for the PE-b-Si samples with various GnP content of 0-2wt%, Isotherms of N_2 at 77K.

Table S1. BJH, DFT analysis for pore diameter and surface areas of the PE-b-Si/GnP aerogel samples.

	[a]S_{BJH} (m^2/g)	[b]d_{DFT}, Dv(d) (nm)	[c]S_{DFT} (m^2/g)
PE-b-Si/0%GnP	---	25.50	859.159
PE-b-Si/0.5%GnP	530.81	26.43	655.09
PE-b-Si/1.0%GnP	579.99	40.17	659.41
PE-b-Si/2.0%GnP	636.96	40.19	643.06

[a]BJH surface area. [b]DFT pore diameter. [c]DFT specific surface area.

Hydrophilicity/hydrophobicity observation:

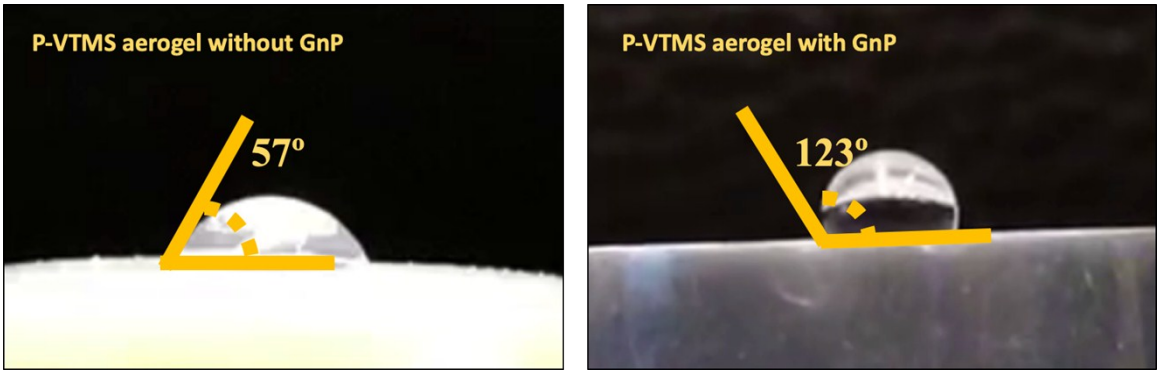


Figure S3. The droplet formation on PVTMS-based aerogel: left: The PVTMS-based aerogel without GnP, right: The PVTMS-based aerogel with GnP.

Microstructure:

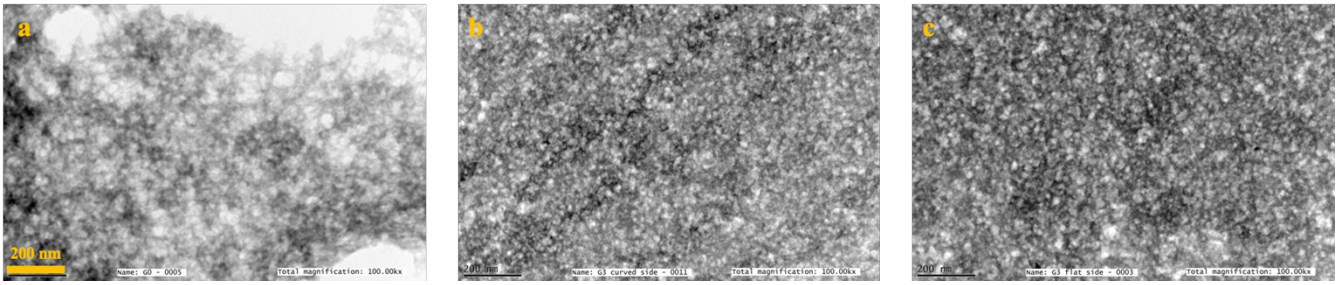


Figure **S4**. The TEM image of samples with and without GnP. (a) sample PE-b-Si/0%GnP, (b) the side view of sample PE-b-Si/2.0%GnP, (c) the cross-section view of PE-b-Si/2.0%GnP. The scale bar in all images represent 200 nm

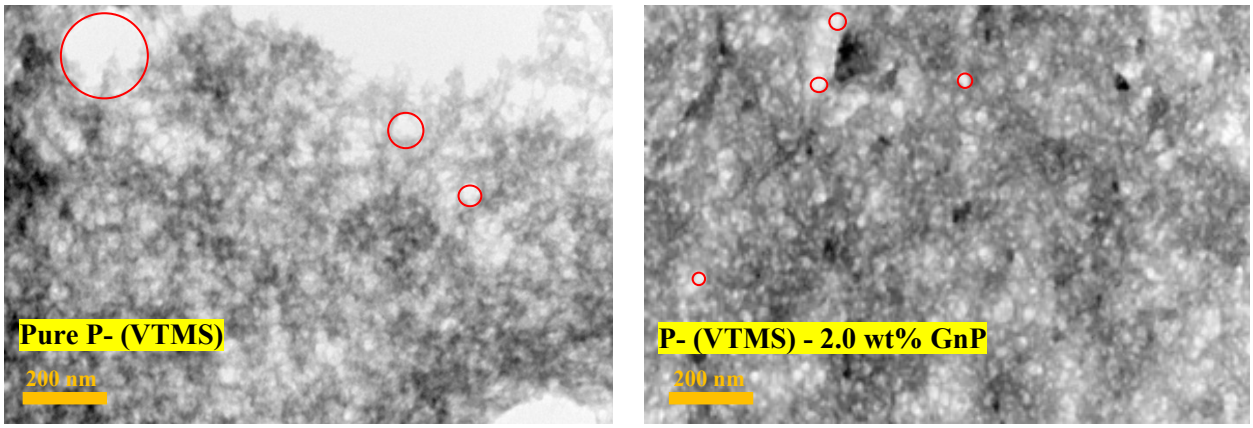


Figure **S5**. The TEM image of samples with and without GnP. (left) sample PE-b-Si/0%GnP, (right) sample PE-b-Si/2.0%GnP. The scale bar in all images represent 200 nm