

Supporting Information

**Flexible Poly(vinyl chloride) Nanocomposites Reinforced with
Hyperbranched Polyglycerol–Functionalized Graphene Oxide for
Enhanced Gas Barrier Performance**

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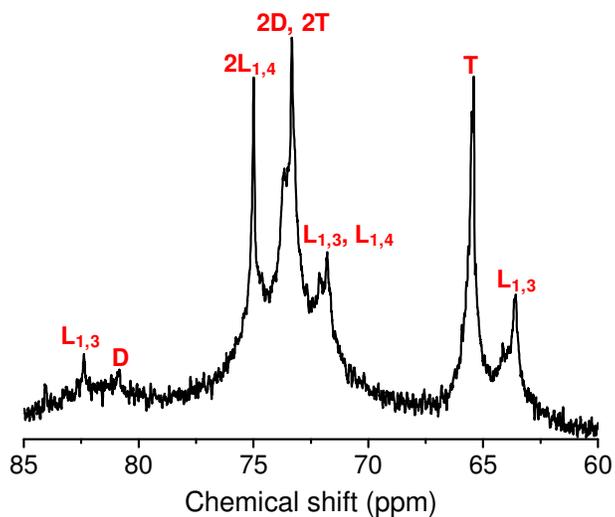


Figure S1. ^{13}C NMR spectrum of the HPG-grafted GO in D_2O .

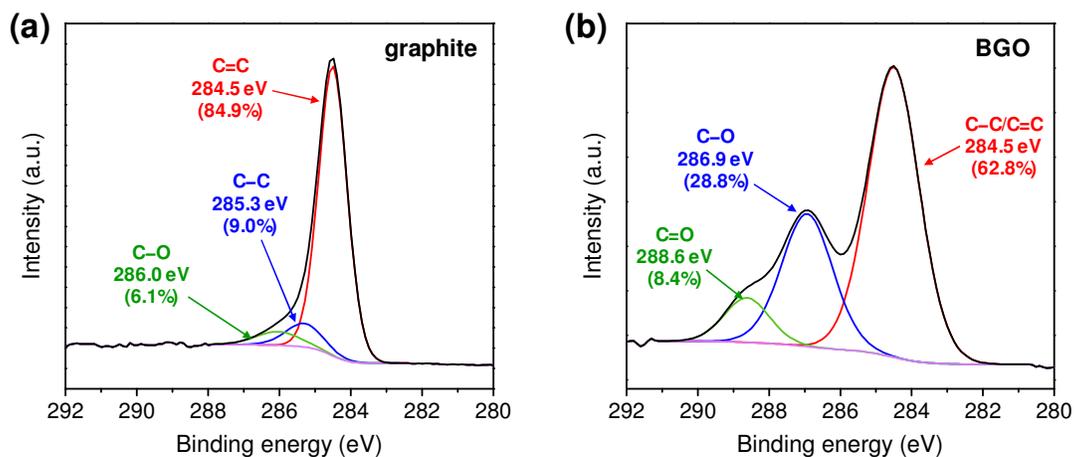


Figure S2. C 1s XPS spectra of (a) graphite and (b) BGO.

Table S1. Atomic percentages of carbon and oxygen in graphite, GO, BGO, and HGO.

Sample	C (at%)	O (at%)	C/O ratio
graphite	92.6	7.4	12.5
GO	60.2	39.8	1.51
BGO	68.3	31.7	2.15
HGO	66.0	34.0	1.94

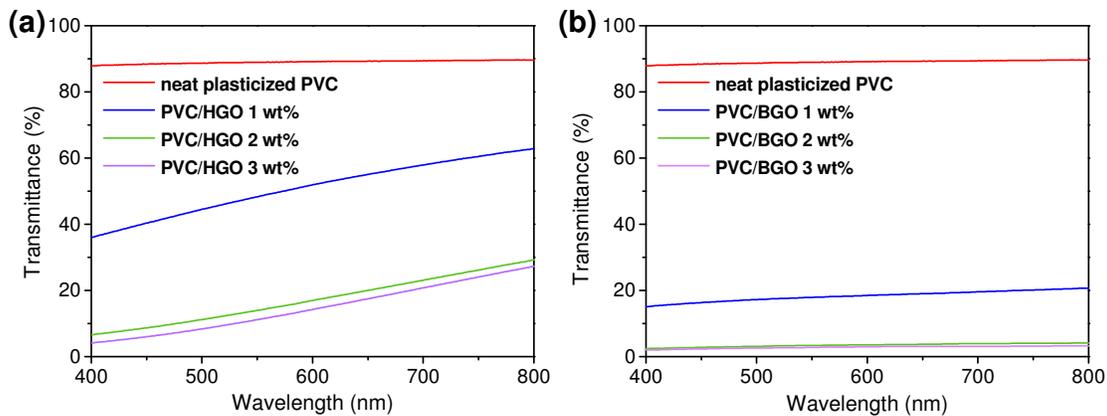


Figure S3. UV-Vis spectra of (a) PVC/HGO and (b) PVC/BGO nanocomposites.

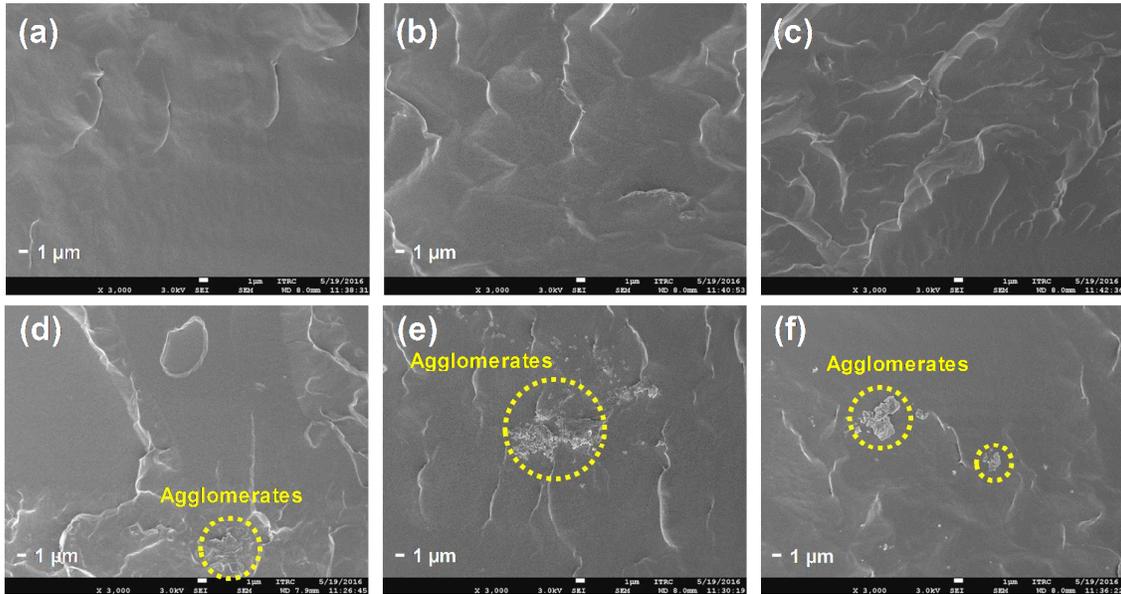


Figure S4. SEM images of fractured surface of (a) PVC/HGO 1 wt%, (b) PVC/HGO 2 wt%, (c) PVC/HGO 3 wt%, (d) PVC/BGO 1 wt%, (e) PVC/BGO 2 wt%, (f) PVC/BGO 3 wt%.

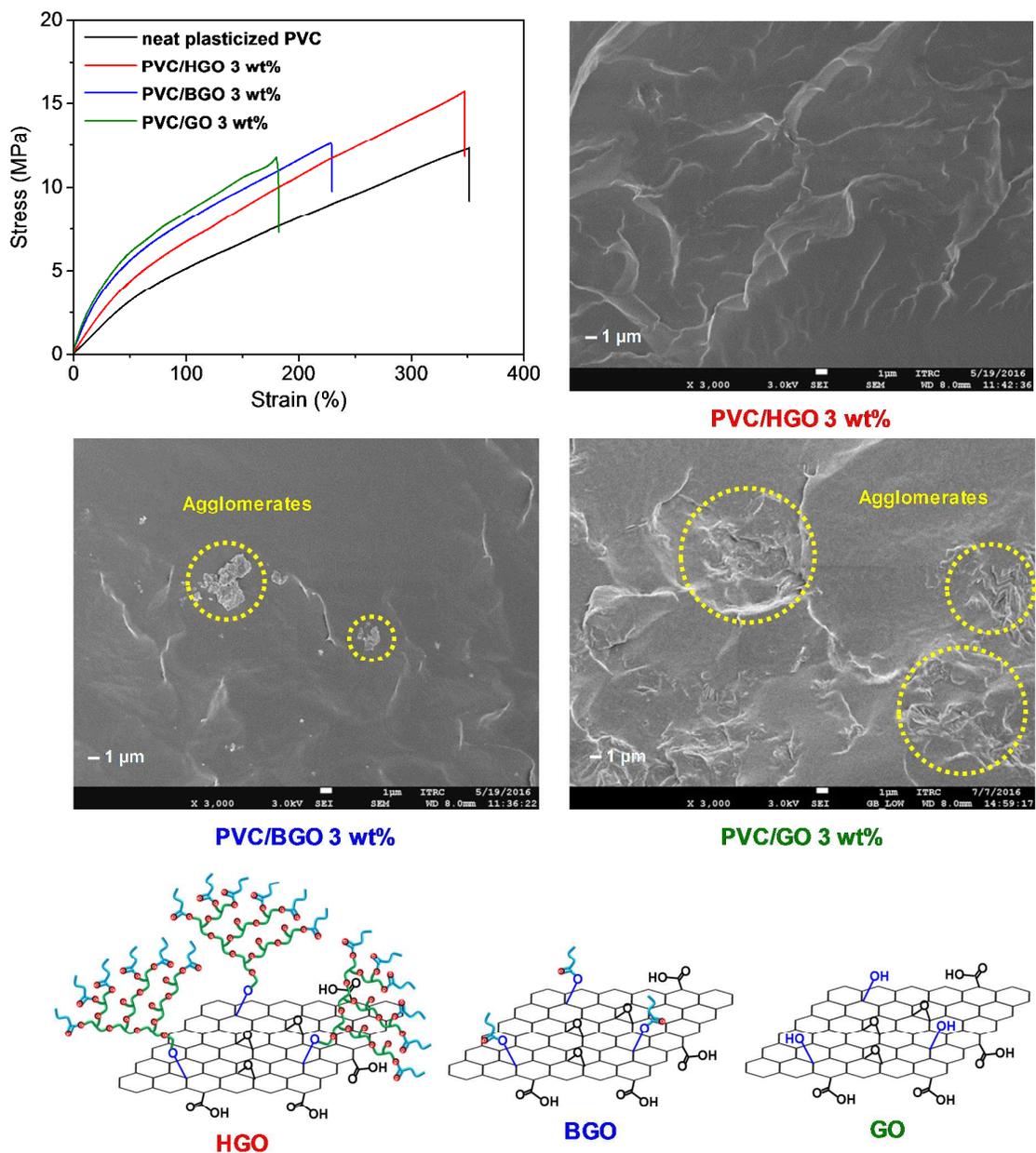


Figure S5. Stress-strain curves of PVC/HGO 3 wt%, PVC/BGO 3 wt%, PVC/GO 3 wt%, and neat plasticized PVC films, and SEM images of fractured surface of the corresponding films.

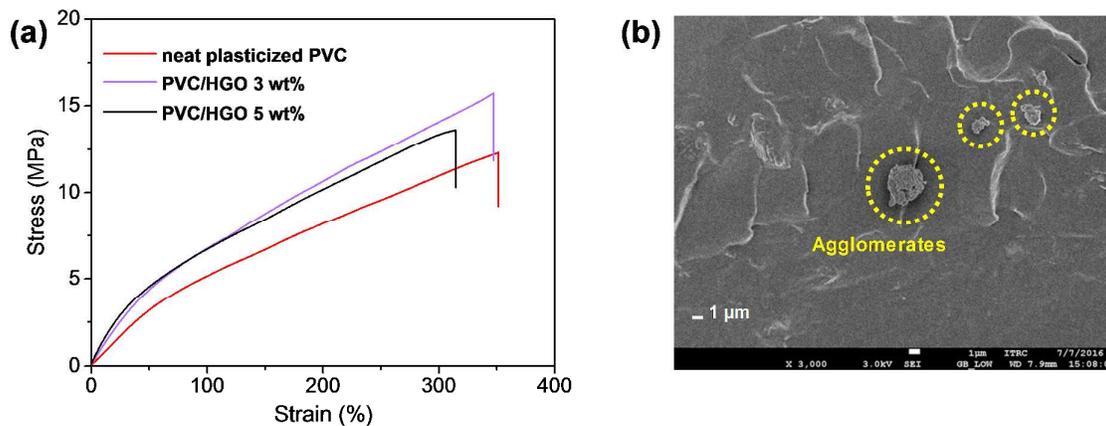


Figure S6. (a) Stress-strain curve of PVC/HGO 5 wt% and (b) SEM image of fractured surface of PVC/HGO 5 wt%.

Table S2. The mechanical and thermal data for neat plasticized PVC and nanocomposites.

Sample	Young's modulus (MPa)	Tensile strength (MPa)	Elongation at break (%)	Toughness (MJ/m ³)	Storage modulus at 25 °C (MPa)	Glass transition temperature (°C)	Temperature at 10% weight loss (°C)
neat plasticized PVC	7.37±0.60	13.8±0.68	351±18.2	28.1±2.99	5.12	26.6	279
PVC/HGO 1 wt%	7.66±0.36	14.6±0.45	375±12.5	31.9±2.78	5.94	27.7	285
PVC/HGO 2 wt%	8.44±0.53	15.2±0.41	353±25.6	31.6±2.76	7.16	29.1	291
PVC/HGO 3 wt%	9.00±0.39	15.9±0.39	351±10.6	32.9±1.67	9.90	31.8	302
PVC/BGO 1 wt%	9.76±0.34	14.0±0.65	324±6.8	27.4±1.80	9.38	28.9	281
PVC/BGO 2 wt%	12.2±0.87	13.7±0.67	281±10.3	23.9±1.15	10.9	30.9	284
PVC/BGO 3 wt%	17.5±1.27	12.7±0.52	229±10.3	19.3±1.95	18.2	34.3	291

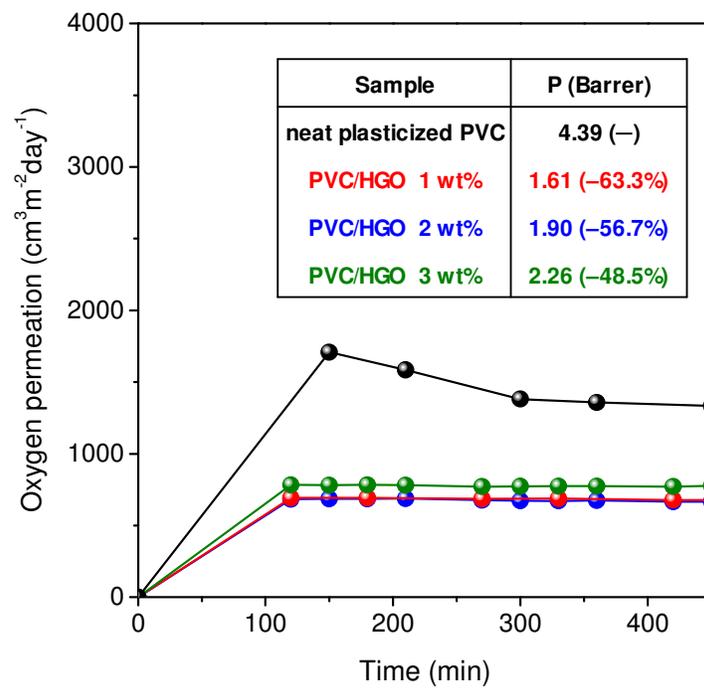


Figure S7. Oxygen permeation fluxes of PVC/HGO nanocomposites.