Supporting Information

Performance Evolution of Alkylation Graphene Oxide Reinforcing High-Density Polyethylene

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Figure S1 The preparation flow chart of the alkylated graphene oxide (MGO)

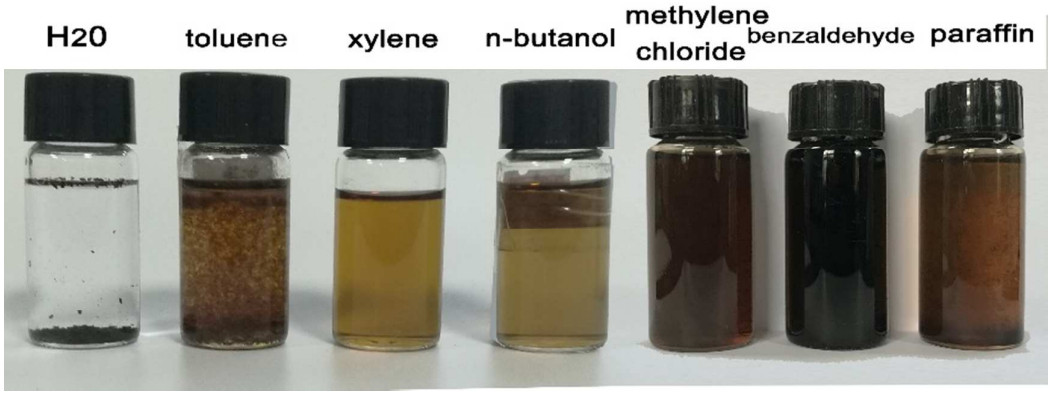

Figure S 2 The picture of MGO in different common solvent at a concentration of 0.5 mg/ml (m/V)

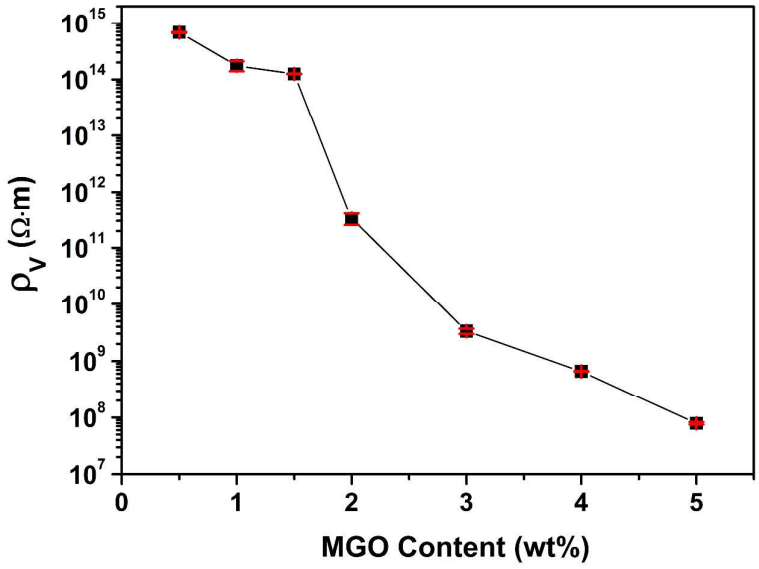

Figure S 3 The volume electrical conductivity of PP/MGO composites.

Table S1 Mechanical properties of HDPE/MGO nano-composites

MGO loadings in HDPE8007 (wt.%)	0	0.25	0.5	1	2	4	5
Tensile Strength (MPa)	23.00 ±0.79	25.34 ±0.27	25.73 ±0.56	25.28 ±0.21	23.56 ±0.19	19.74 ±0.64	17.73 ±0.35
Elongation at break (%)	640 ±32	480 ±24	420 ±56	390 ±36	108 ±22	8 ±1	6 ±2

Table S2 Thermal stability of the HDPE/MGO nano-composites

MGO loadings	T_{d20} (°C)	$T_{d,\ max}$ (°C)
NEAT	442	466
HDPE/MGO-0.25.wt%	448	472
HDPE/MGO-0. 5.wt%	449	475
HDPE/MGO-1.wt%	451	479
HDPE/MGO-2.wt%	456	480
HDPE/MGO-3.wt%	458	480
HDPE/MGO-4.wt%	460	481
HDPE/MGO-5.wt%	462	482

Td20: Value determined by the weight loss of 20 wt.%; Td, max: the peak value of the 1st derivative profiles derived from the TGA curves. Heating rate is all 10°C/min.