Supporting Information

Li$^+$/Na$^+$ co-assisted hydrothermal exfoliation for graphite into few-layer graphene nanosheets and their excellent friction reducing performance

Zhi-Lin Cheng*, Ying-Chao Kong, Zan Liu
School of Chemistry and Chemical Engineering, Yangzhou University,
180 Siwangting Road, Hanjiang District, Yangzhou 225002, China
*Corresponding Authors:
Prof. Zhi-Lin Cheng, Email: zlcheng224@126.com

Supporting Information Contents:
Number of pages: 8
Number of figures: 7
Figure S1. SEM images of graphite (A) and HGN with different ratios of alkali metal ion (HGN-Li(B), HGN-Li0.3/Na0.7 (C), HGN-Li0.5/Na0.5 (D), HGN-Li0.7/Na0.3 (E), HGN-Na(F)).
Figure S2. AFM height maps of HGN-Li (A), HGN-Li0.3/Na0.7 (B), HGN-Li0.5/Na0.5 (C), HGN-Li0.7/Na0.3 (D), HGN-Na (E).
Figure S3. AFM topographic images (A, B, C, the final powder (D) and water solution (E) of HGN-Li0.5/Na0.5;
Figure S4. UV-vis absorbance spectra (A) of graphite and HGN obtained with different Li/Na proportions in ethanol; UV-vis absorbance spectra (B) of HGN-Li0.5/Na0.5 with different concentrations in ethanol and the standard curves of the concentration depending on the absorbance (inset) of HGN-Li, HGN-Li0.5/Na0.5 and HGN-Na at 269 nm.
Figure S5. Photographs of HGN samples dispersed in ethanol after standing for one month and the Tyndall effect of the as-exfoliated HGN dispersions.
Figure S6. TGA curves of graphite and HGN-Li0.5/Na0.5.
Figure S7. (A,C) 3D laser scanning micrographs and (B,D) corresponding Raman spectra of worn steel balls tested by castor oil (A, B) and 0.04 wt.% HGN-based castor oil (C, D), respectively; (E) the photography of HGN-based castor oil after standing for 15 days.