

## Supporting Information

Environment-friendly, scalable exfoliation for few-layered hexagonal boron nitride nanosheets (BNNSs) by multi-times thermal expansion based on releasing gases

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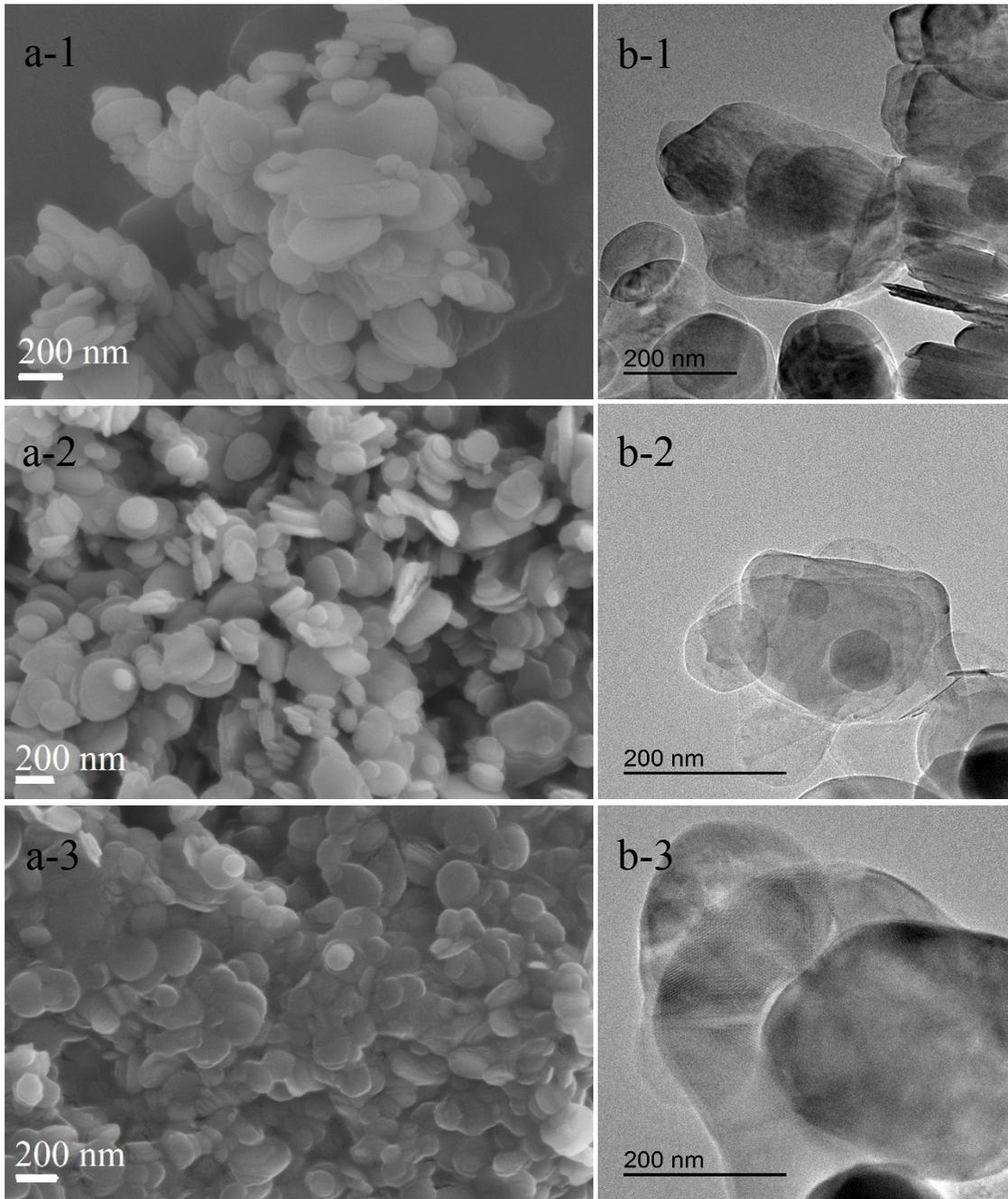


Figure S1. SEM (a) and TEM (b) images of bulk h-BN, the BNNSs-1 and BNNSs-2.

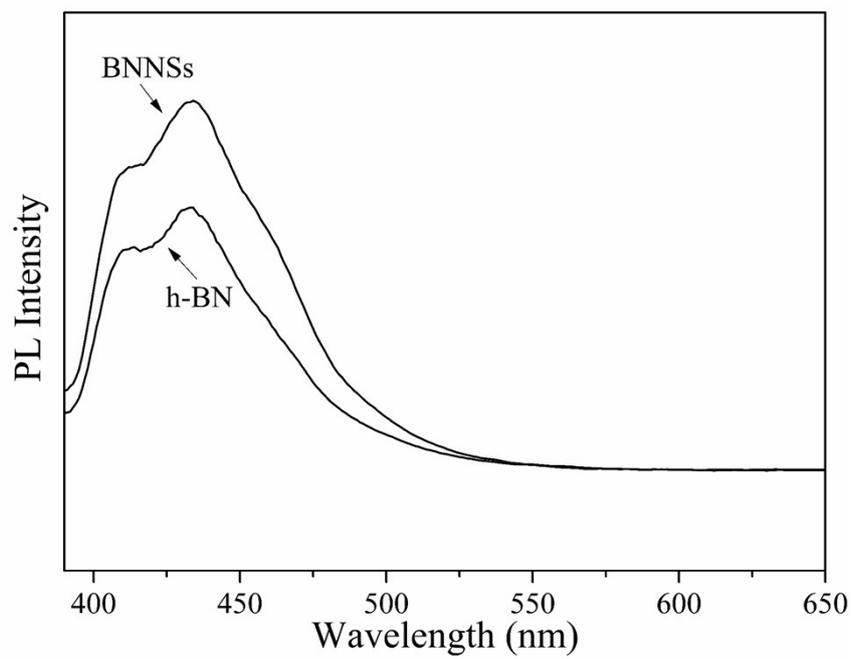


Figure S2. The photoluminescence (PL) spectra of h-BN and the BNNs-3.

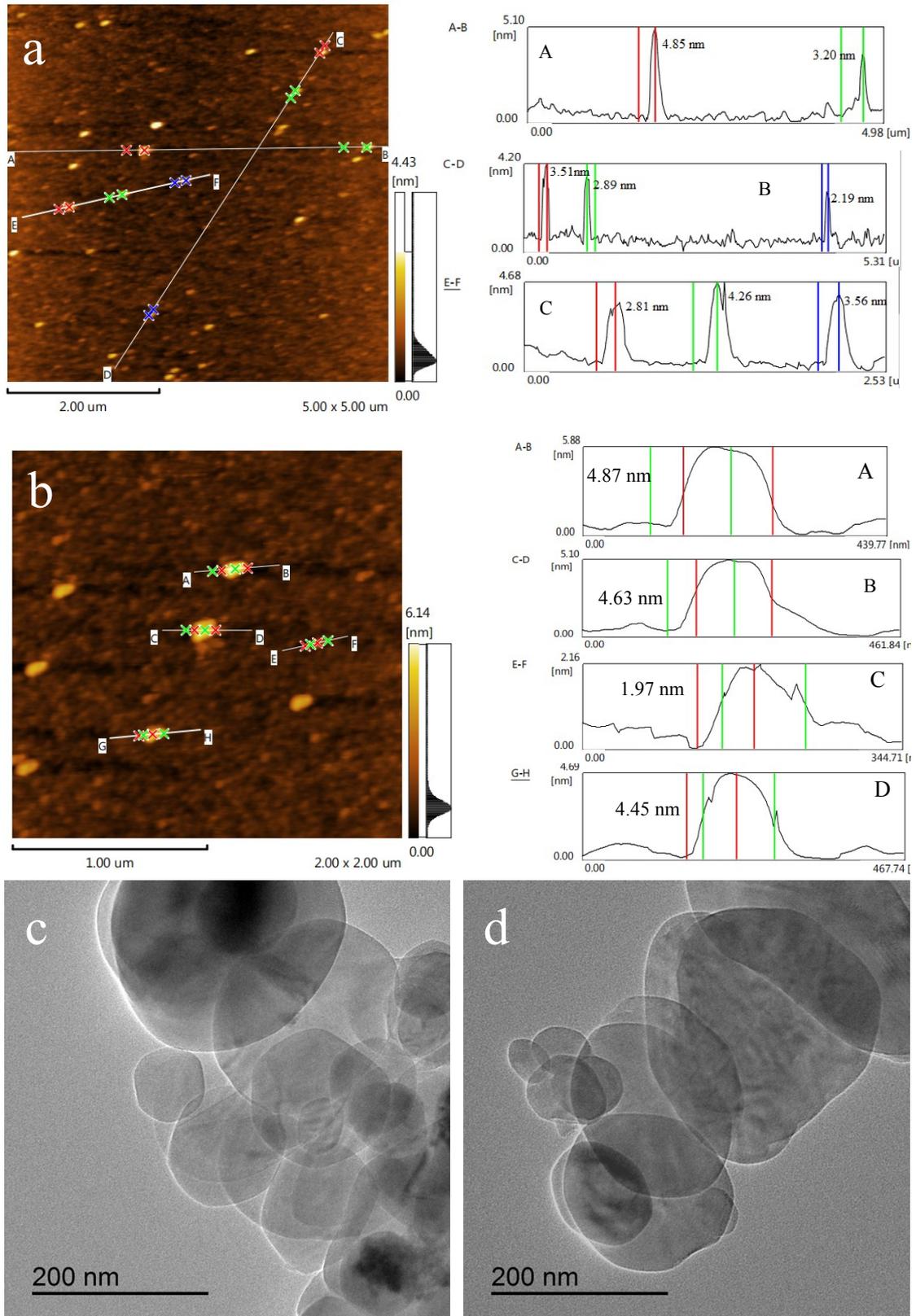


Figure S3. Statistical analysis of the thickness and lateral size of the BNNSSs-3 measured from AFM images (a, b) and TEM images (c, d).

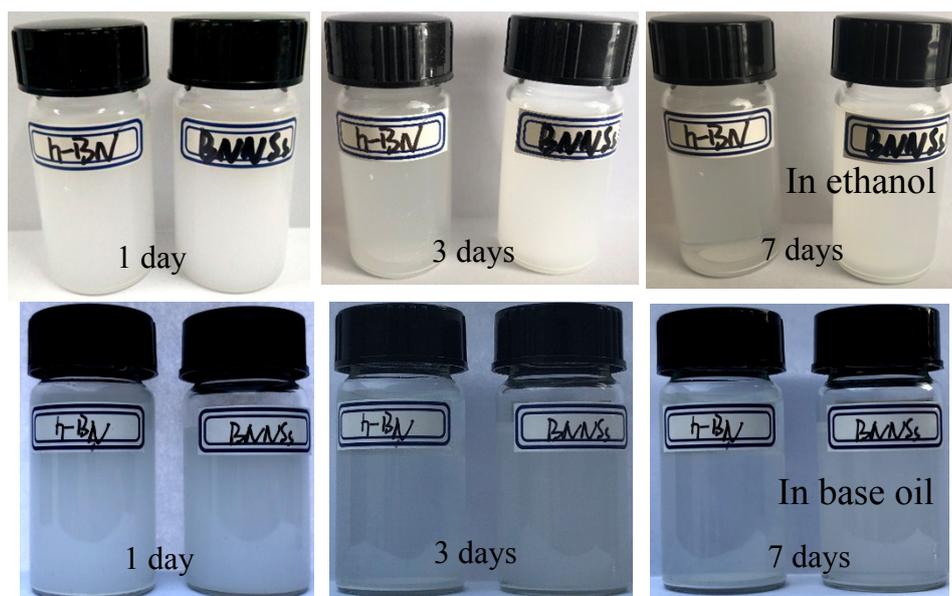


Figure S4. The dispersion photos of h-BN and the BNNSs-3 in ethanol and base oil along with settling time (Initial concentration of the BNNSs-3 and h-BN: 0.4 mg/mL).

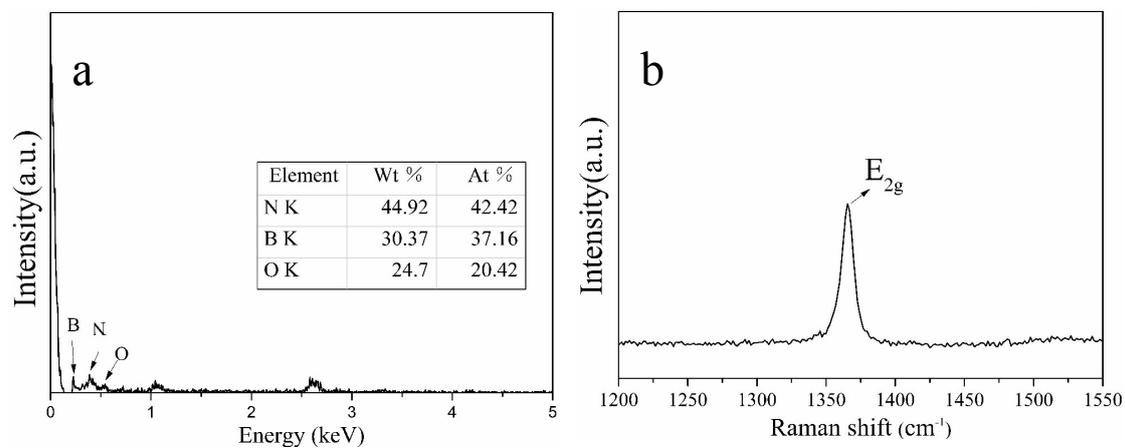


Figure S5. The EDS (a) and Raman spectra (b) of worn steel ball tested by 0.06 wt% BNNSs-based oil.

Table S1 The concentration and stability of the BN solvent described in the literature

Initial Concentration	Method	Stability	Ref.
30mg/ml	High energy ball mill	Hydrogel after 2 weeks	[38]
0.1 mg/ml	Ultrasound	Lots of sediment after 4 weeks	[23]
0.2 mg/ml	Liquid-phase exfoliation	0.2 mg/ml after 2 hours	[53]
0.2 mg/ml	Liquid-phase exfoliation	Lots of sediment after 2 hours	[53]
0.4 mg/ml	Thermal expansion	0.07 mg/ml after 1 week	This work