

Electronic Supplementary Material (ESI) for Materials Horizons.  
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## Supplementary Information

### Efficient anti-icing/deicing via photothermal-wind synergistic effects on femtosecond laser-induced superhydrophobic graphene

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Contents: Supplementary Figures S1 to S9, Supplementary Videos S1 to S5

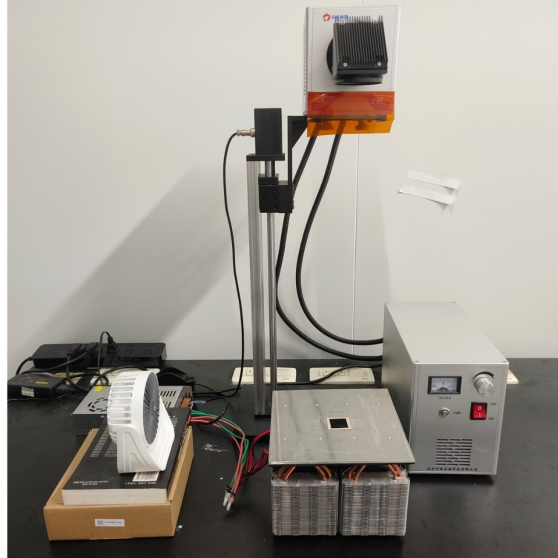


Figure S1. Optical image of the anti-icing/de-icing experimental scene.

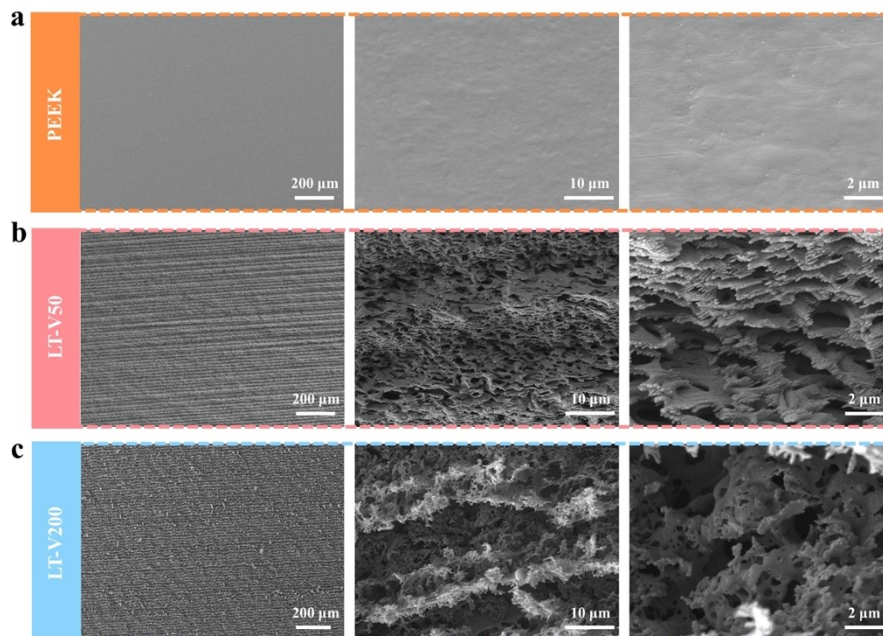


Figure S2. SEM images of (a) PEEK, (b) LT-V50, and (c) LT-V200 surfaces at different magnifications.

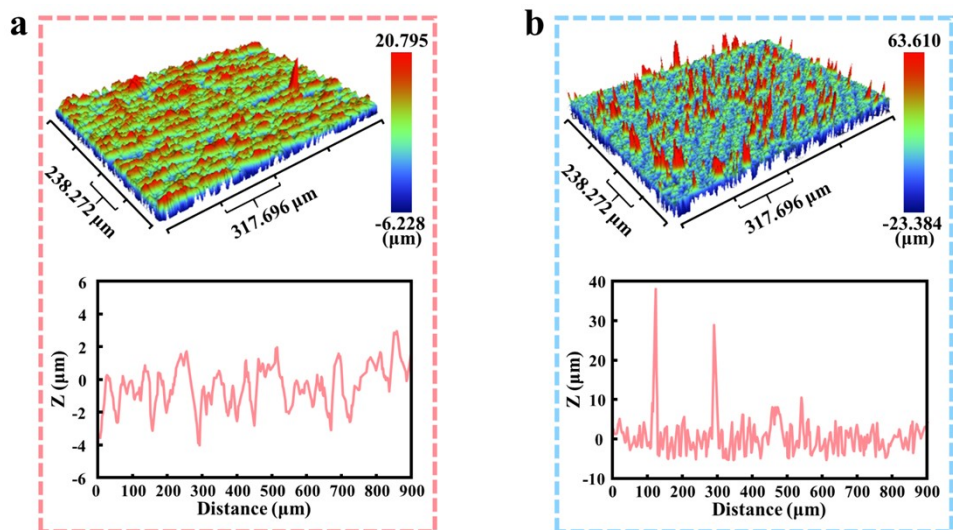


Figure S3. 3D surface morphology and cross-sectional profile images of (a) LT-V50 and (b) LT-V200.

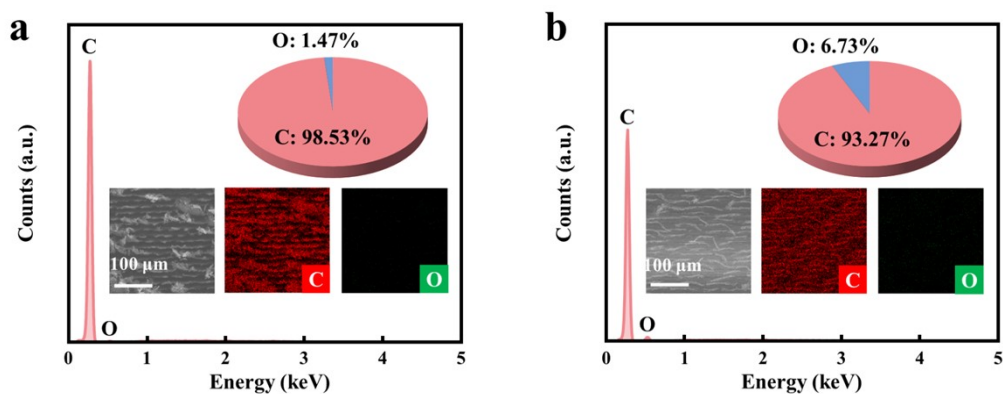


Figure S4. EDS spectrum and elemental mappings of (a) LT-V50 and (b) LT-V200.

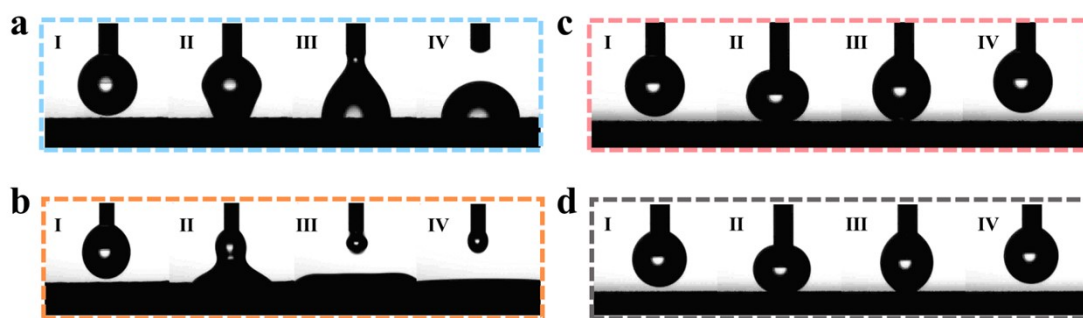


Figure S5. Dynamic adhesion test of a water droplet on the (a) PEEK, (b) LT-V50, (c) LT-V80, and (d) LT-V200, respectively.

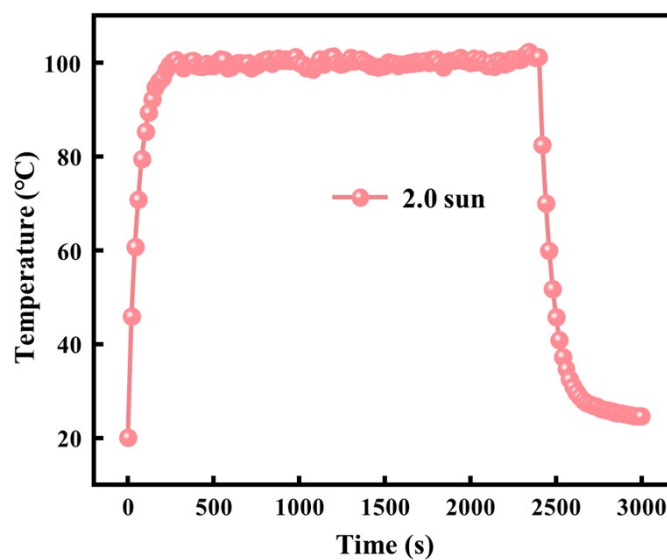


Figure S6. Photothermal stability test of LT-V80 under 2.0 sun illumination.

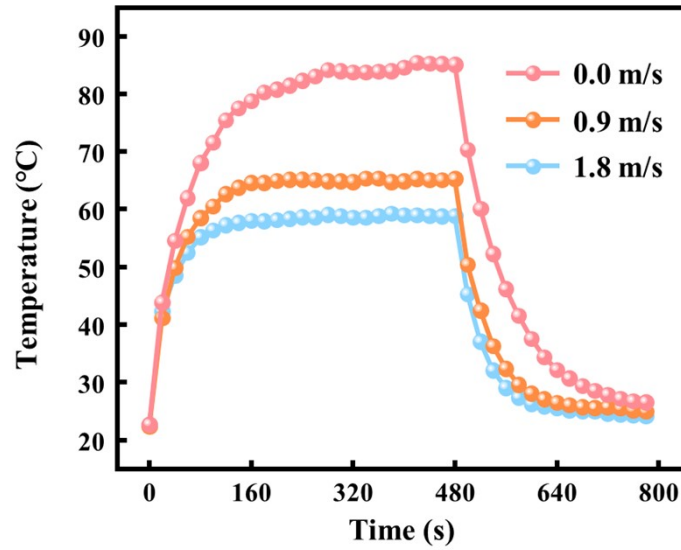


Figure S7. Surface temperature variation curves of LT-V80 under 1.5 sun illumination at different wind speeds.

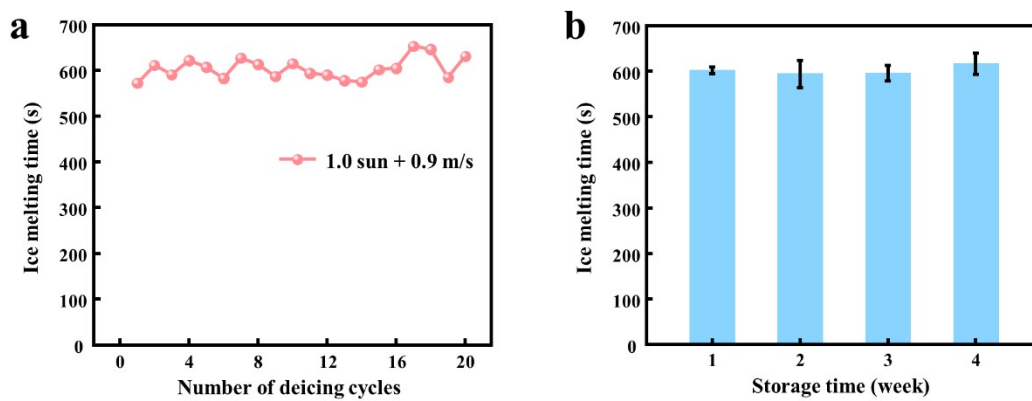


Figure S8. (a) The ice melting times on the LT-V80 surface during 20 test cycles. (b) The ice melting times on LT-V80 surfaces placed in air for 4 weeks. The experimental conditions are 1.0 sun illumination and a wind speed of 0.9 m/s.

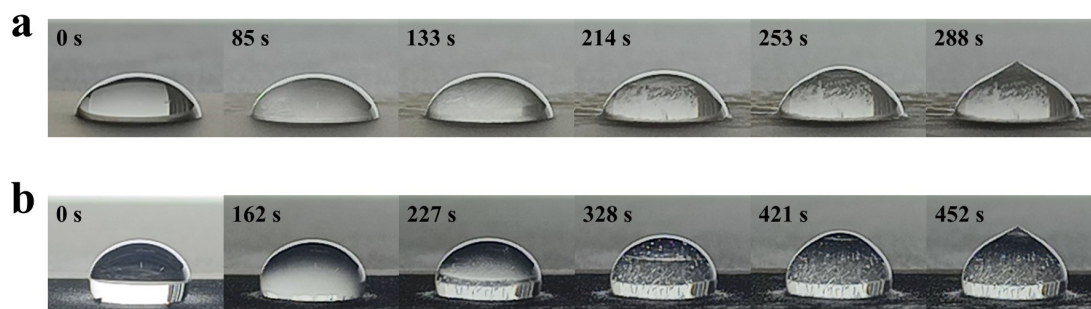


Figure S9. (a) Optical images of a water droplet (0.1 mL) freezing process on PEEK surface. (b) Optical images of a water droplet (0.1 mL) freezing process on LT-V80 surface.

Video S1. A water droplet impacting on the LT-V80 surface.

Video S2. The self-cleaning process of LT-V80 surface.

Video S3. Ice melting process under 1.0 sun illumination.

Video S4. Icing process under 0.7 sun illumination.

Video S5. The process of ice melting in outdoor environments.