

Supporting Information

High-strength, stable, and energy-efficient bacterial nanocellulose composite films for efficient light management

*Chenguang Wang^{*1}, Libin Deng², Yanjie Zhou³*

1Hunan City University, Changsha 410082, China

2Hunan Academy of Transportation Sciences Co., Ltd, Changsha 410015, China

3Heshan District Garden Landscaping Co., Ltd., Changsha 410015, China

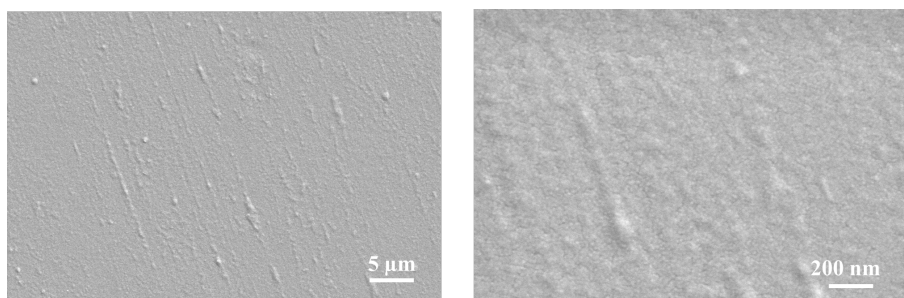


Figure S1. SEM images of PF resin flm.

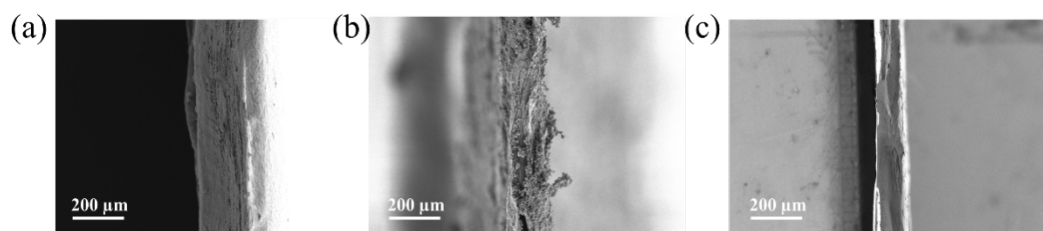


Figure S2. Cross-sectional SEM image of (a) BNC, (b) BNC/ZnO and (c) BNC/ZnO-PF film.

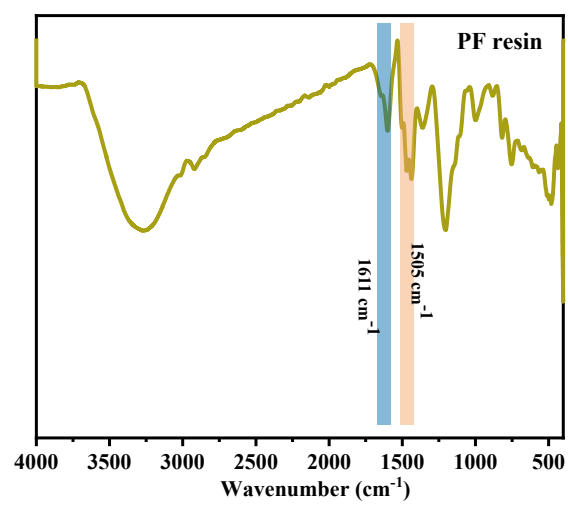


Figure S3. FT-IR spectra of PF resin flm.

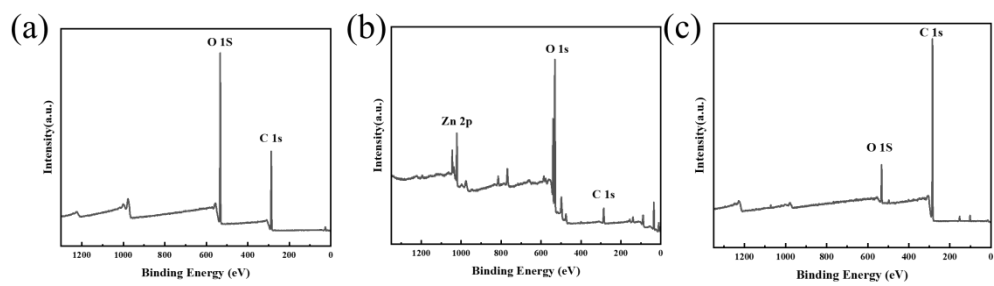


Figure S4. The XPS spectrum of (a) BNC、(b) BNC/ZnO and (c) BNC/ZnO-PF flm.

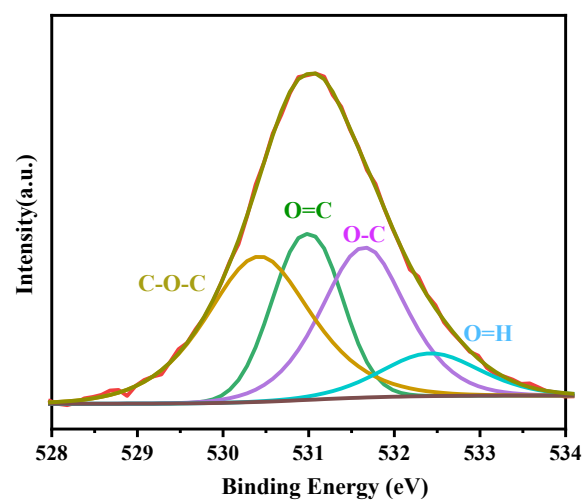


Figure S5. The XPS high-resolution O1s spectrum of BNC/ZnO-PF film

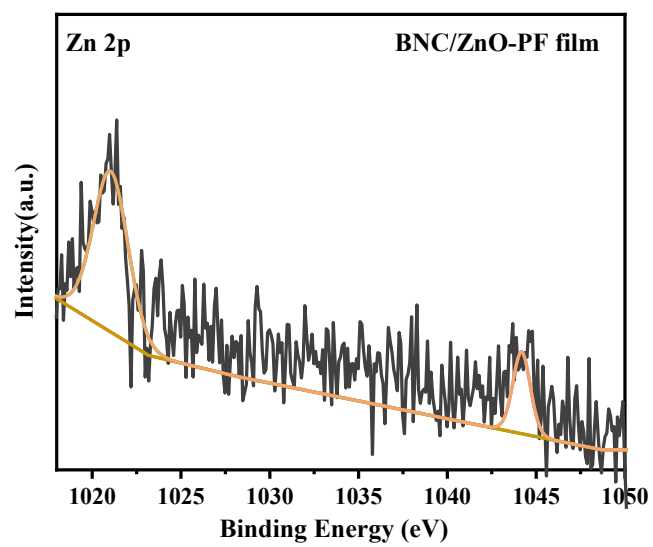


Figure S6. The XPS high-resolution Zn2p spectrum of BNC/ZnO-PF film.

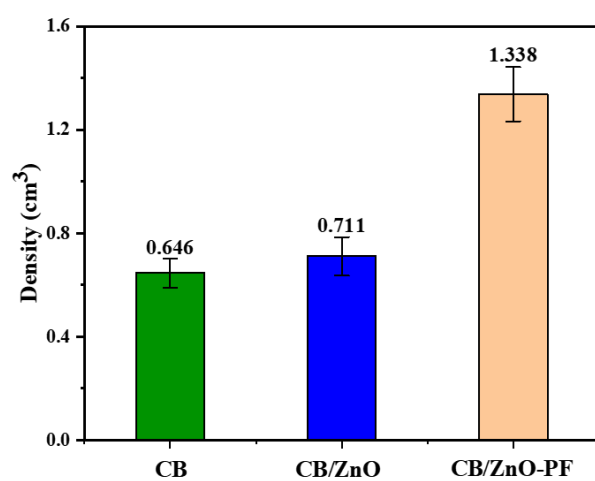


Figure S7. The density of BNC、BNC/ZnO and BNC/ZnO-PF flm.

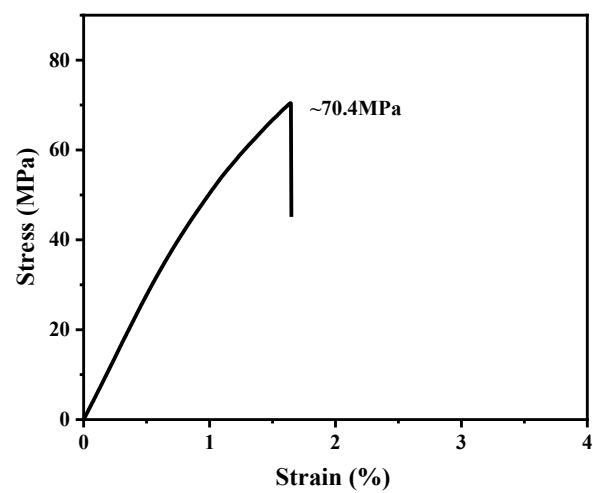


Figure S8. Tensile stress–strain curves of the PF resin film.

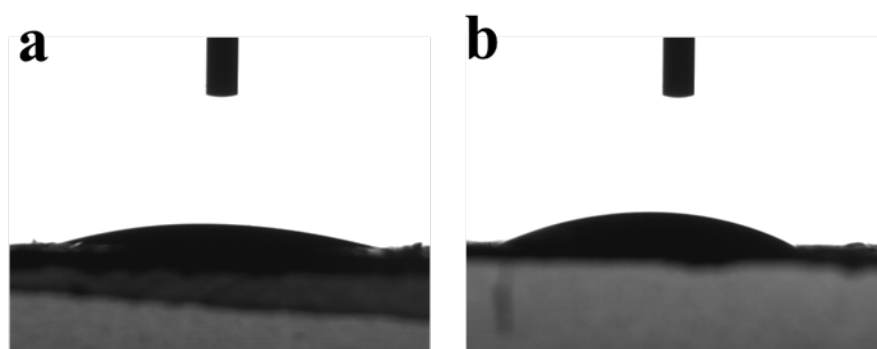


Figure S9. The WCA of (a) BNC and (b) BNC/ZnO flm.



Figure S10. The underwater load-bearing test of BNC film.

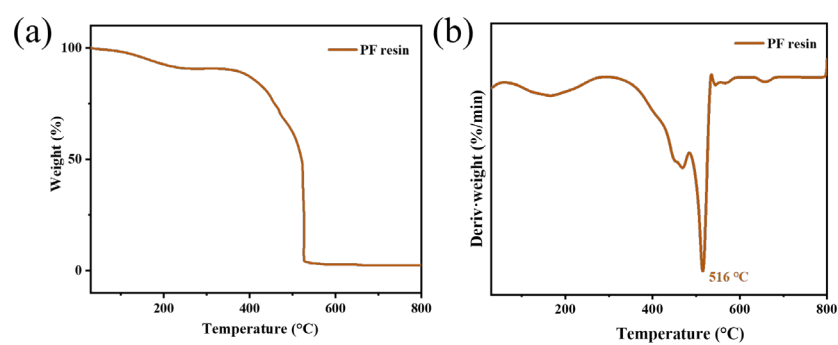


Figure S11. (a) TGA and (b) DTG curves of PF resin flm.

Table S1. The element content in BNC film.

Element	Wt% (%)	Wt% Sigma (%)	At (%)
C	84.03	0.23	83.67
O	15.87	0.22	16.11
Zn	0.10	0.09	0.02

Table S2. The element content in BNC/ZnO film.

Element	Wt% (%)	Wt% Sigma (%)	At (%)
C	37.41	0.30	34.48
O	45.77	0.23	47.17
Zn	18.82	0.14	18.35

Table S3. The element content in BNC/ZnO-PF film.

Element	Wt% (%)	Wt% Sigma (%)	At (%)
C	72.63	0.34	73.55
O	25.65	0.32	25.02
Zn	1.72	0.10	1.43

Table S4. Calculated electrical properties based on the current density-voltage characteristics for the bare GaAs cell and GaAs cells with BNC/ZnO-PF flm.

Sample	J_{sc} (mAcm ⁻²)	V_{oc} (V)	FF
GaAs cell	20.1	1.07	0.82
GaAs cell with BNC/ZnO-PF flm	22.0	1.08	0.85