Supplementary Information (SI) for Journal of Materials Chemistry A.
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Electronic Structure Regulation of Carbon Atoms from Wood for Enhancing Zn-Air Batteries Performances

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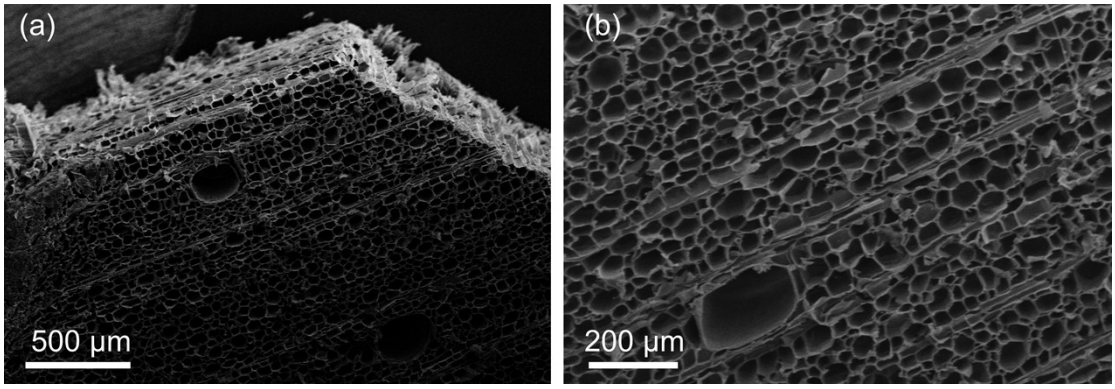


Figure S1. (a and b) SEM images of balsa wood.

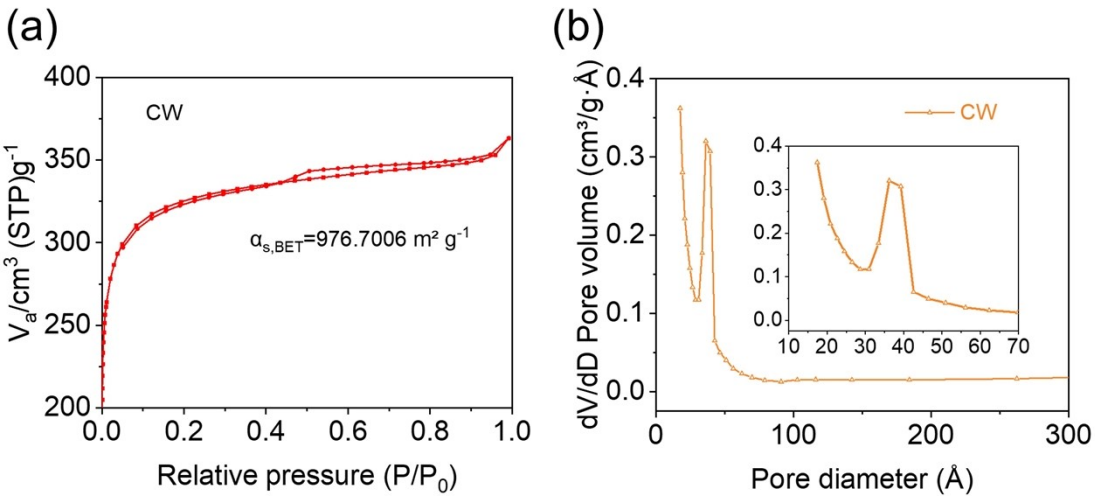


Figure S2. (a) Nitrogen adsorption/desorption isotherms and (b) corresponding calculated pore size distribution of CW-900.

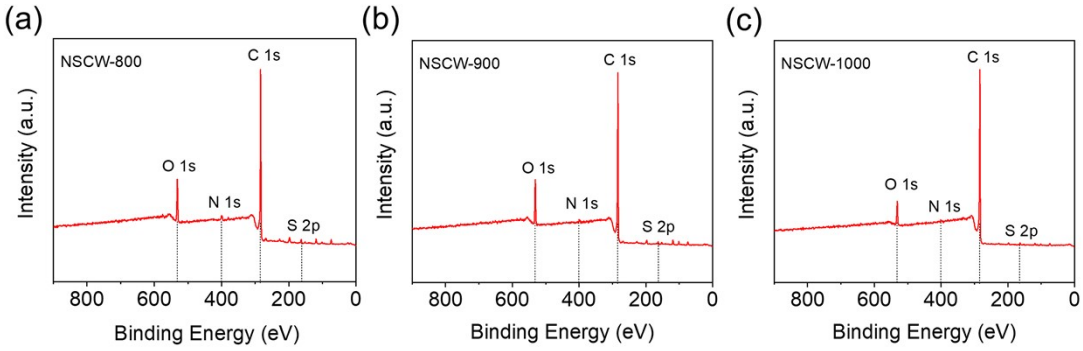


Figure S3. XPS mapping of (a) NSCW-800, (b) NSCW-900 and (c) NSCW-1000.

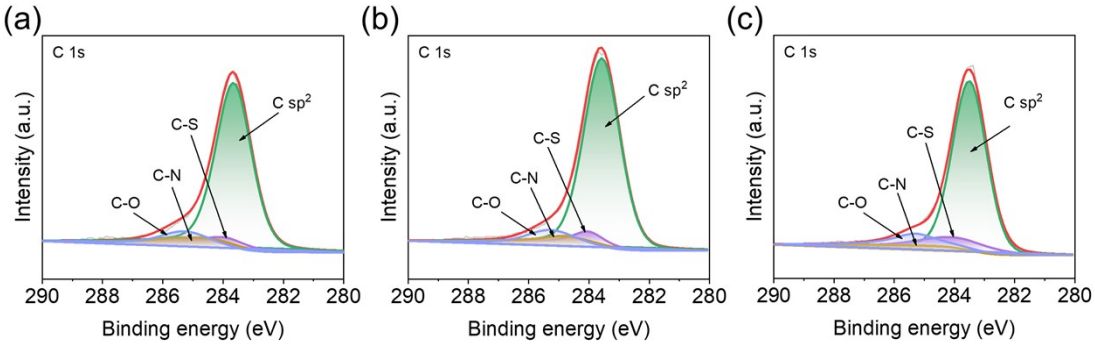


Figure S4. High-resolution C 1s spectrum of (a) NSCW-800, (b) NSCW-900 and (c) NSCW-1000.

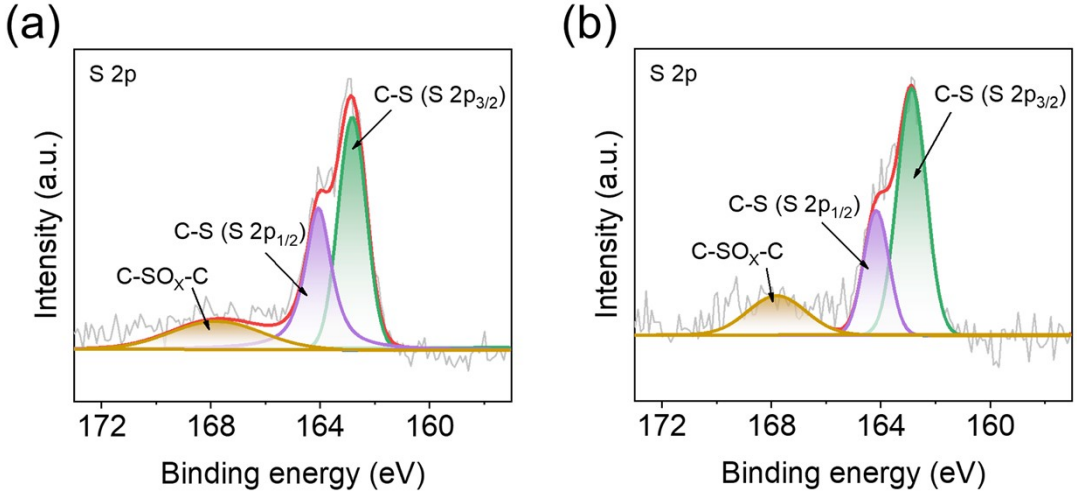


Figure S5. High-resolution S 2p spectrum of (a) NSCW-800 and (b) NSCW-1000.

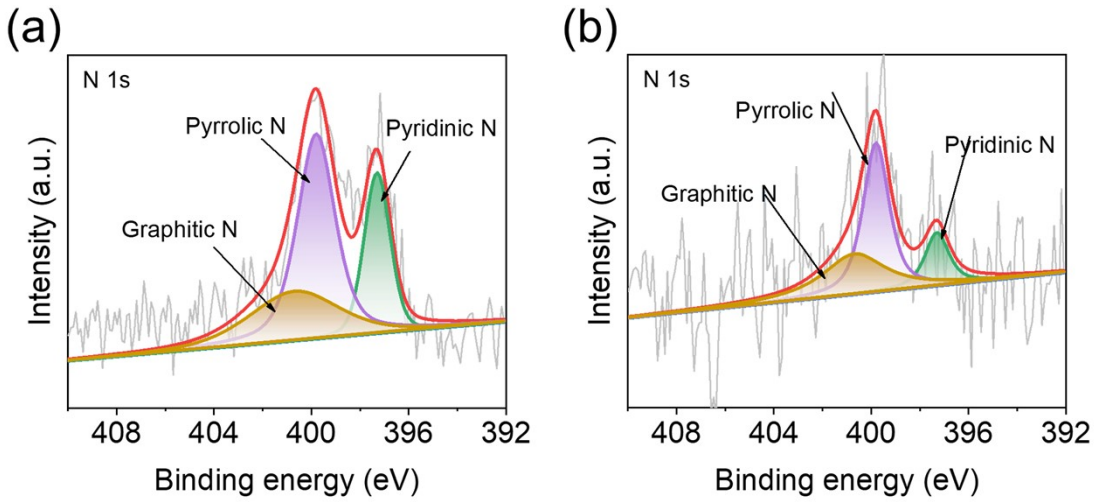


Figure S6. High-resolution N 1s spectrum of (a) NSCW-800 and (b) NSCW-1000.

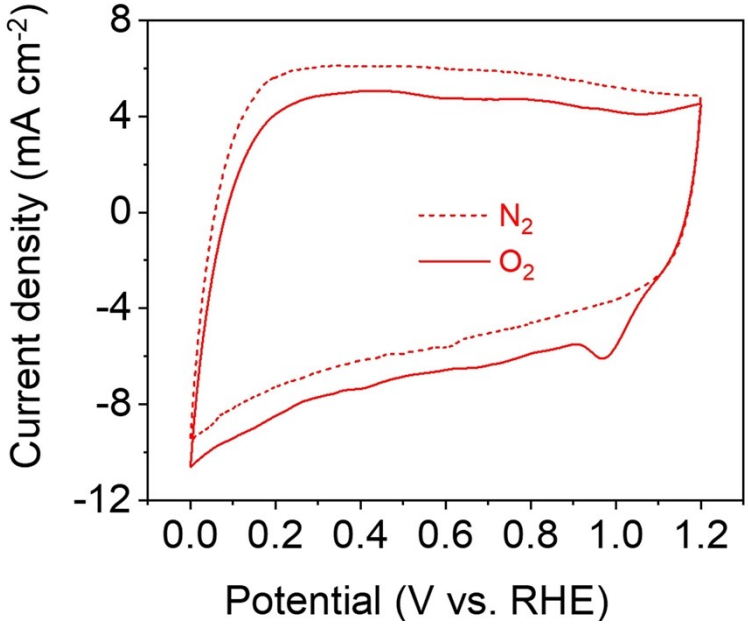
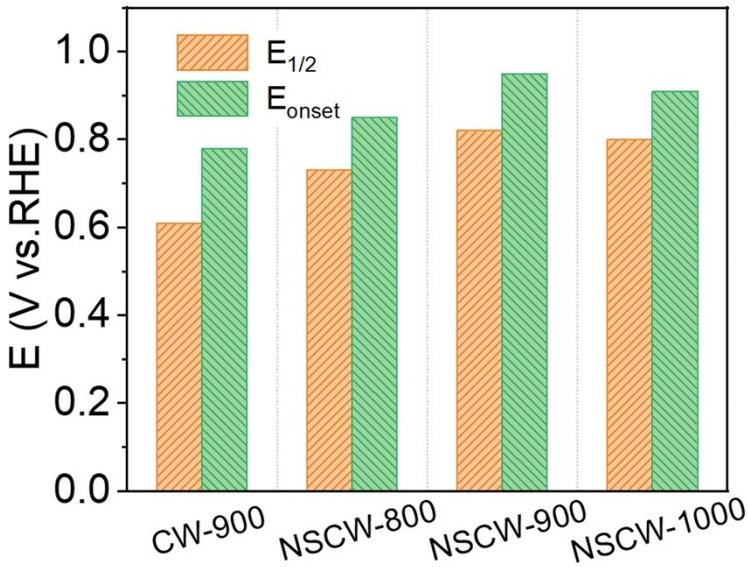


Figure S7. CV curves of NSCW-900.



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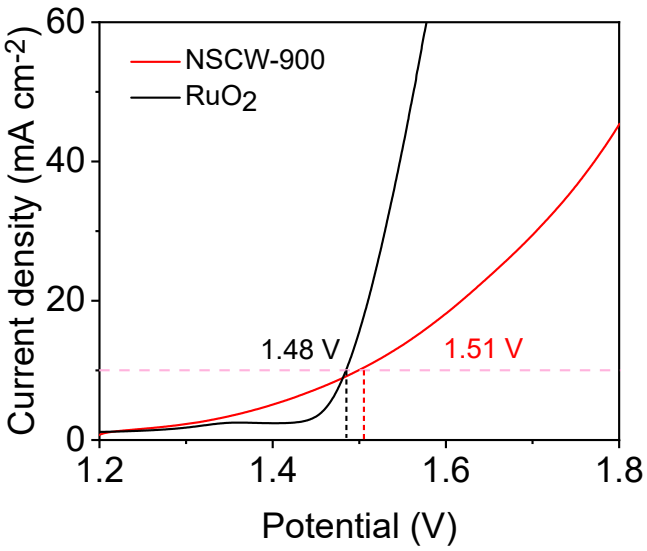
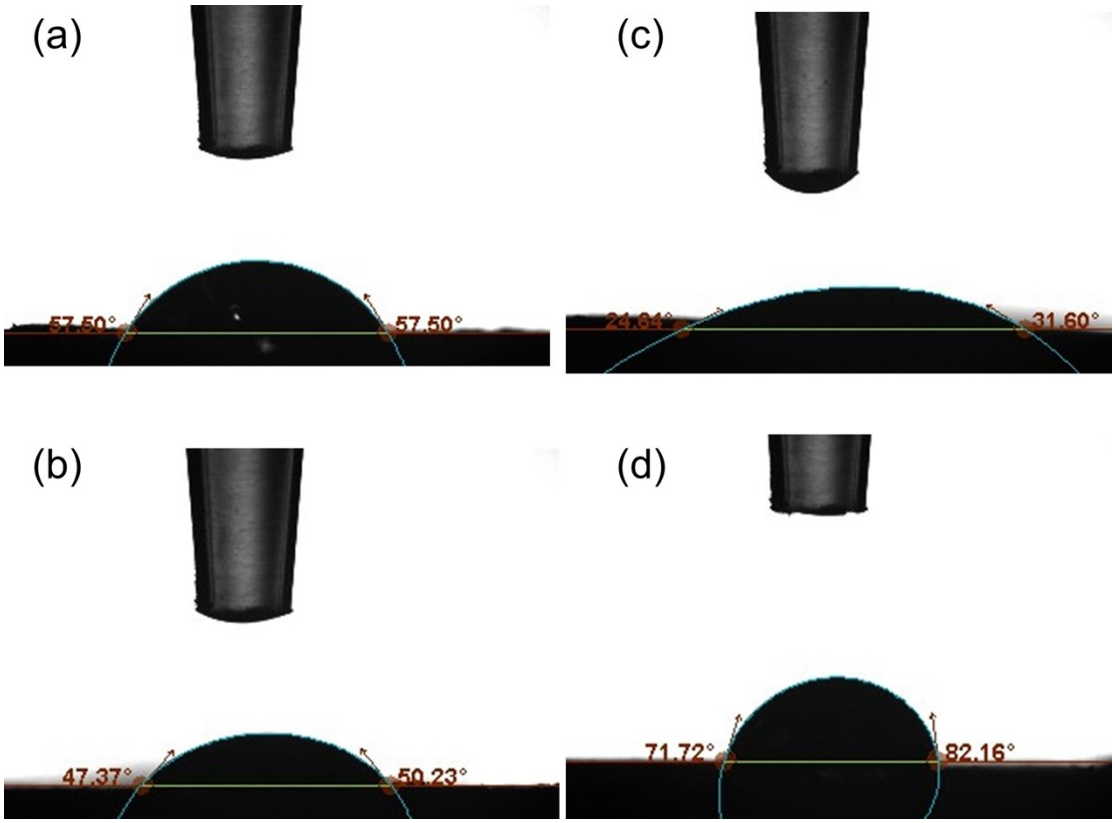


Figure S9. OER curves of the catalysts.



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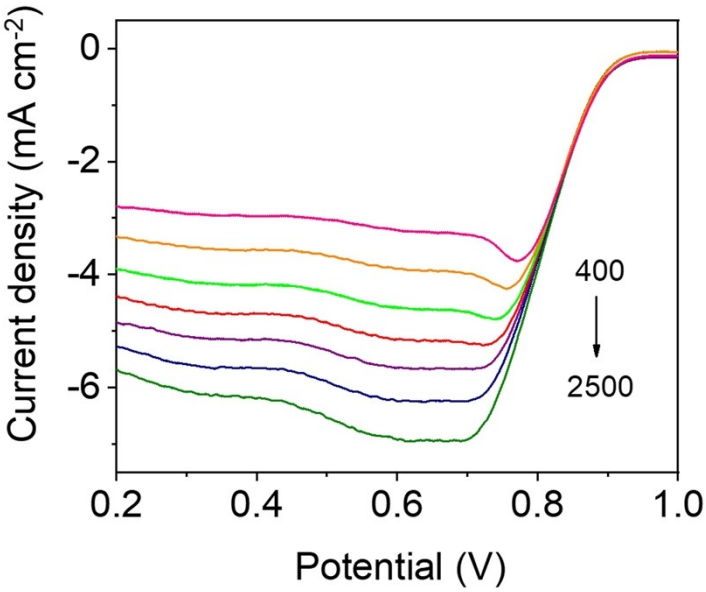

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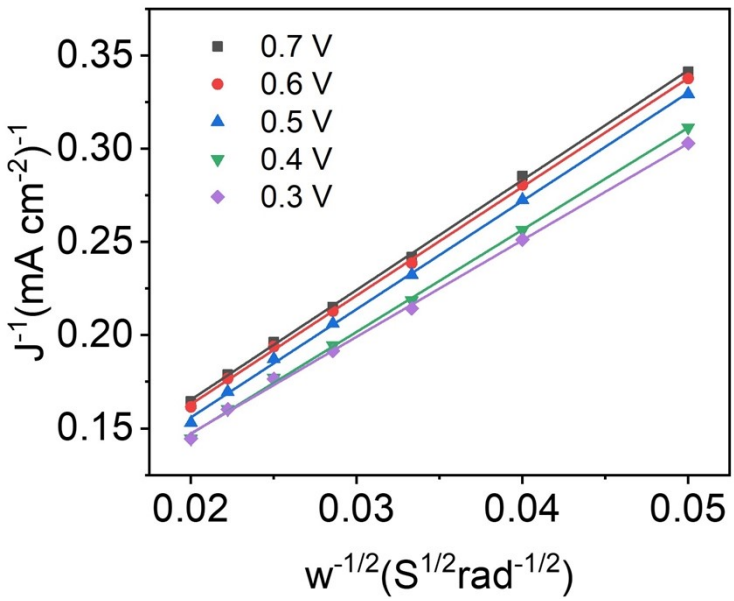

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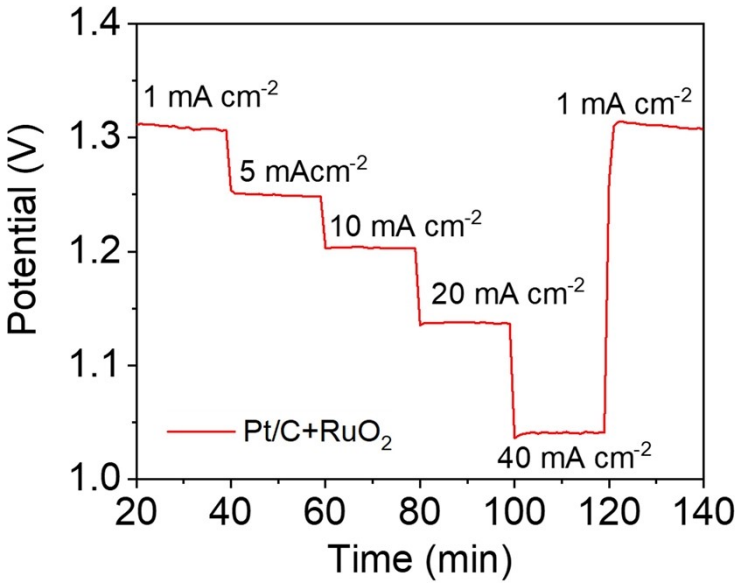

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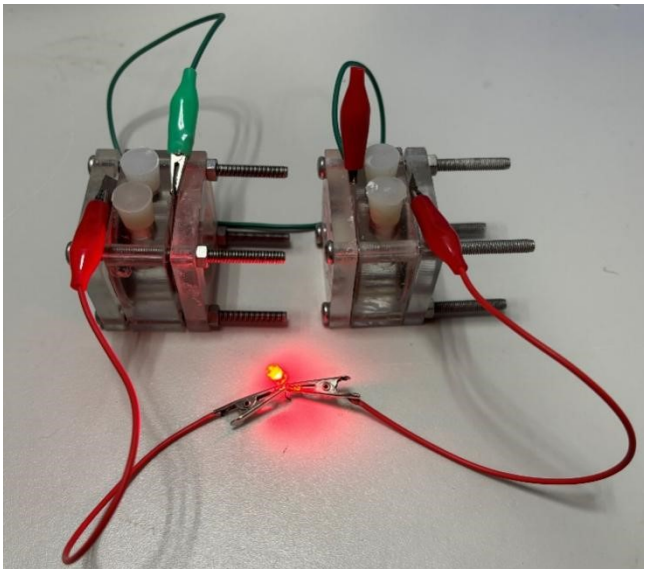

Figure S14. Image of the LED powered by two liquid ZABs with NSCW-900.

Table S1. The elemental content of NSCW-800, NSCW-900 and NSCW-1000 from XPS.

Catalysts	C（At.%）	O（At.%）	N（At.%）	S（At.%）
NSCW-800	82.6	12.72	3.28	1.4
NSCW-900	84.32	12.47	2.33	0.88
NSCW-1000	90.22	6.95	1.96	0.88

Table S2. The ratios of different N species according to XPS results.

Catalysts	Pyridinic N (%)	Graphitic N (%)	Pyrrolic N (%)
NSCW-800	23.7	22.5	53.6
NSCW-900	31.2	25.7	43.1
NSCW-1000	25.8	33.3	42.9

Table S3. Summary of the catalytic activities of the reported related electrocatalysts in 0.1 M KOH.

Catalysts	$E_{1/2}$(V) (V vs. RHE)	Ref.
NSCW-900	**0.832**	**This work**
CN-ZTC	0.81	[1]
$NOPHC_{10}$-900	0.77	[2]
N/S-2DPC-60	0.74	[3]
NBCNT-10	0.82	[4]
RGO	0.79	[5]
N, F-MCFs	0.81	[6]
N-RGO-800	0.72	[7]
BN-CDs	0.77	[8]
BN/C	0.8	[9]
CNT-550-NS	0.81	[10]
NSP-Gra	0.82	[11]

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