Supplementary Information (Sustainable Energy & Fuels)

Cellulose-Derived Flake Graphite as positive electrode for Al-ion batteries

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Table S1. The I_D/I_G values of cellulose resources after electrolysis were calculated under different conditions.

Conditions .	abbreviation	D peak position (cm^{-1})	G peak position (cm^{-1})	I_D/I_G
Carbon-containing precursor	CCP	1331	1592	2.634
950℃-2.8V-1h	FG1	1347	1595	1.667
950℃-2.8V-2h	FG2	1349	1560	1.681
950℃-2.8V-4h	FG3	1347	1580	0.76
950℃-2.8V-6h	FG4	1349	1596	0.64
800℃-2.8V-8h	FG5	1343	1596	2.068
850℃-2.8V-8h	FG6	1347	1590	1.055
900℃-2.8V-8h	FG7	1347	1576	0.531
950℃-2.8V-8h	FG8	1347	1577	0.197
950℃-2.0V-8h	FG9	1351	1602	1.663
950℃-2.2V-8h	FG10	1350	1598	1.420
950℃-2.4V-8h	FG11	1346	1589	0.946
950℃-2.6V-8h	FG12	1346	1592	0.819

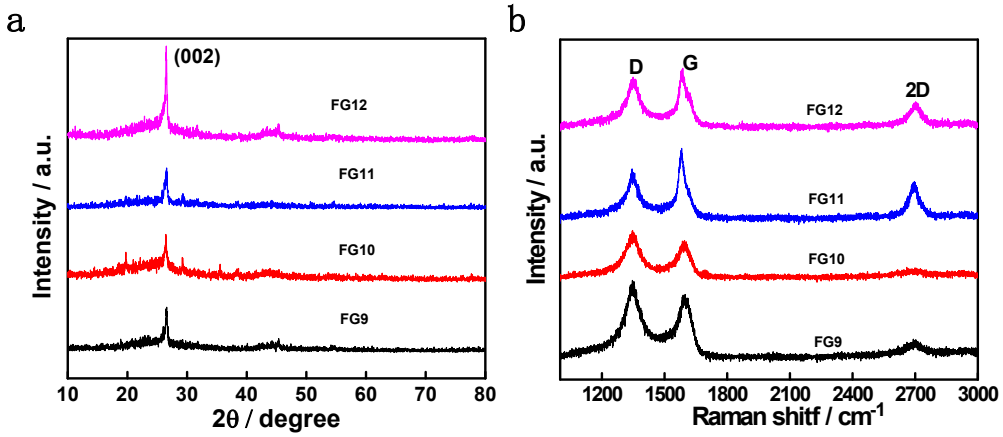

Figure S1. (a) XRD patterns of cellulose resources after cathodic electrolysis under 2.0 V, 2.2 V, 2.4 V and 2.6 V, which obtained FG9, FG10, FG11 and FG12 at 950 °C for 8 h. (b) Raman spectra of cellulose resources after cathodic electrolysis under 2.0 V, 2.2 V, 2.4 V and 2.6 V, which obtained FG9, FG10, FG11 and FG12 at 950 °C for 8 h.

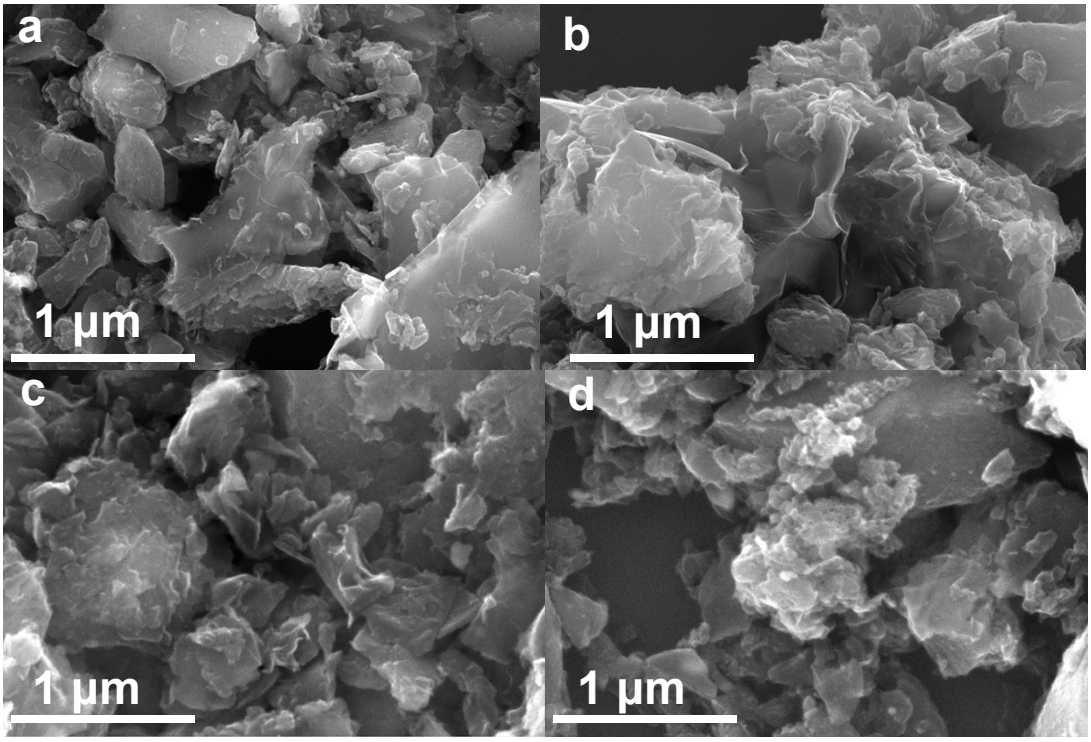

Figure S2. SEM images of Cellulose material after cathodic electrolysis cathodic under different constant cell voltages : (a) 2.0 V, (b) 2.2 V, (c) 2.4 V, (d) 2.6 V at 950 °C for 8 h.

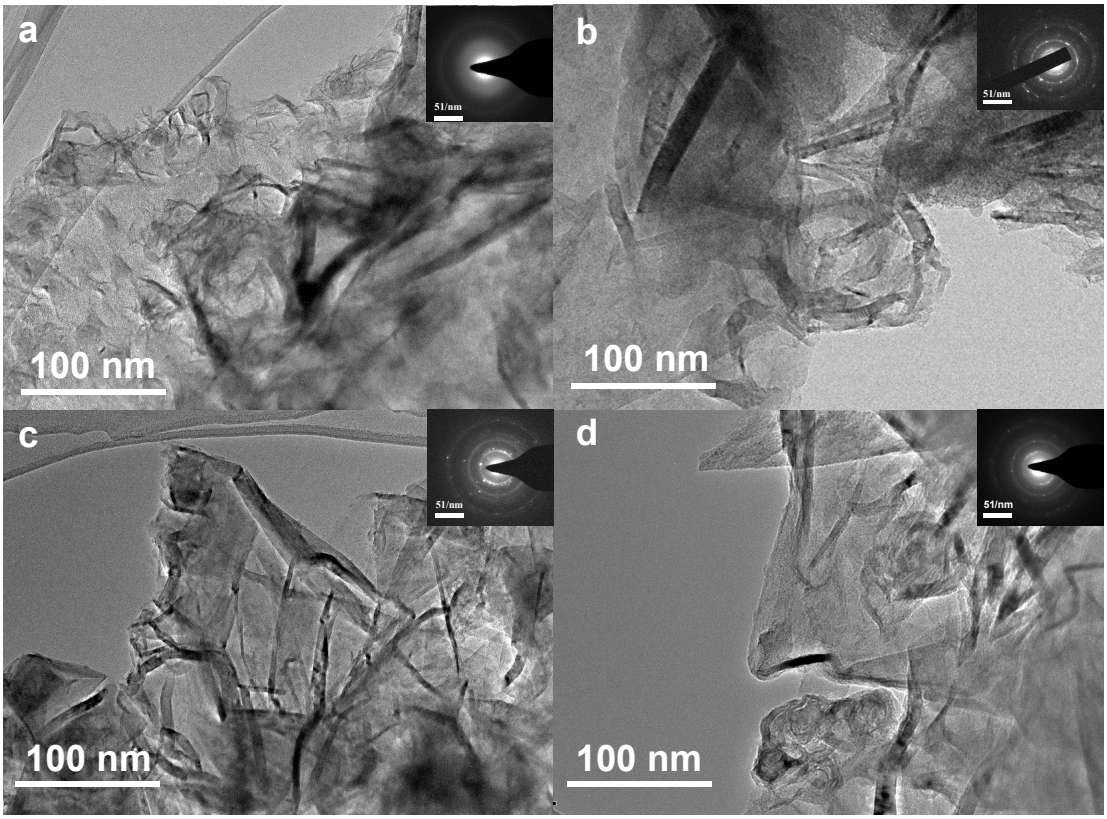

Figure S3. TEM images of Cellulose material after cathodic electrolysis cathodic under different constant cell voltages : (a) 2.0V, (b) 2.2 V, (c)2.4V,(d)2.6V at 950 °C for 8 h.

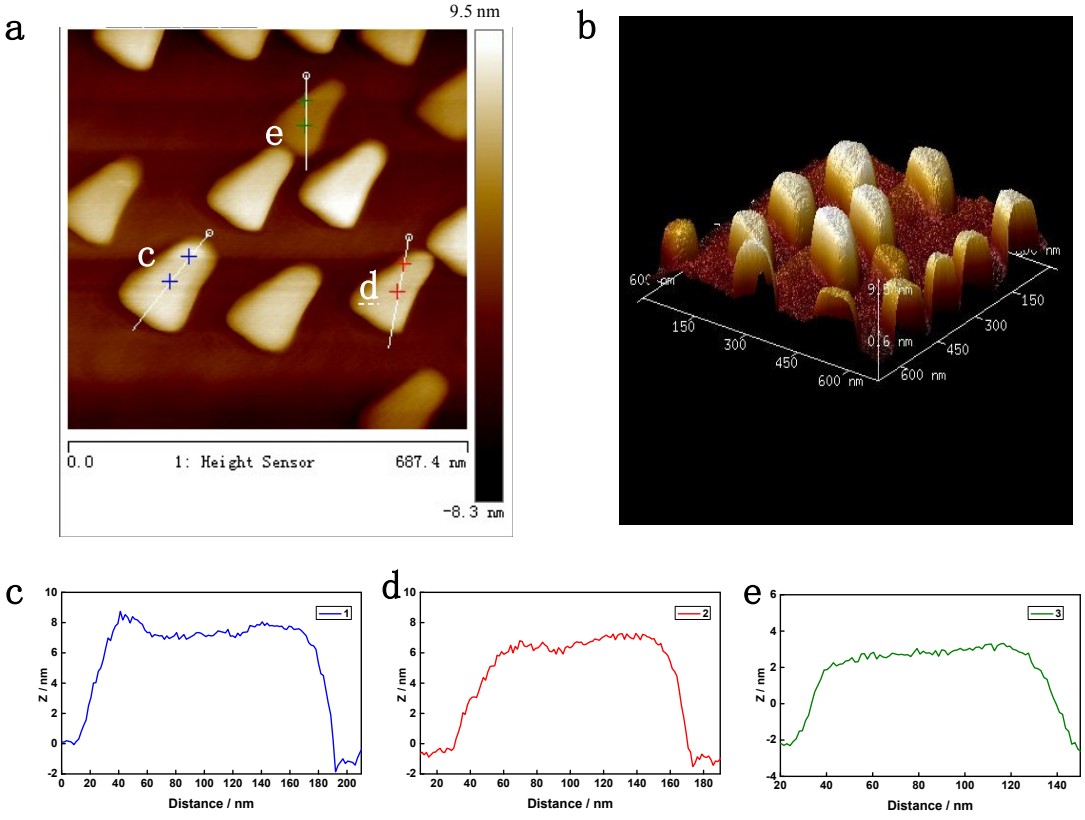

Figure S4. Typical AFM and 3D AFM images of the electrolyzed sample under 2.8 V at 950 °C for 8 h (a,b). The thinness at different locations (c-e).

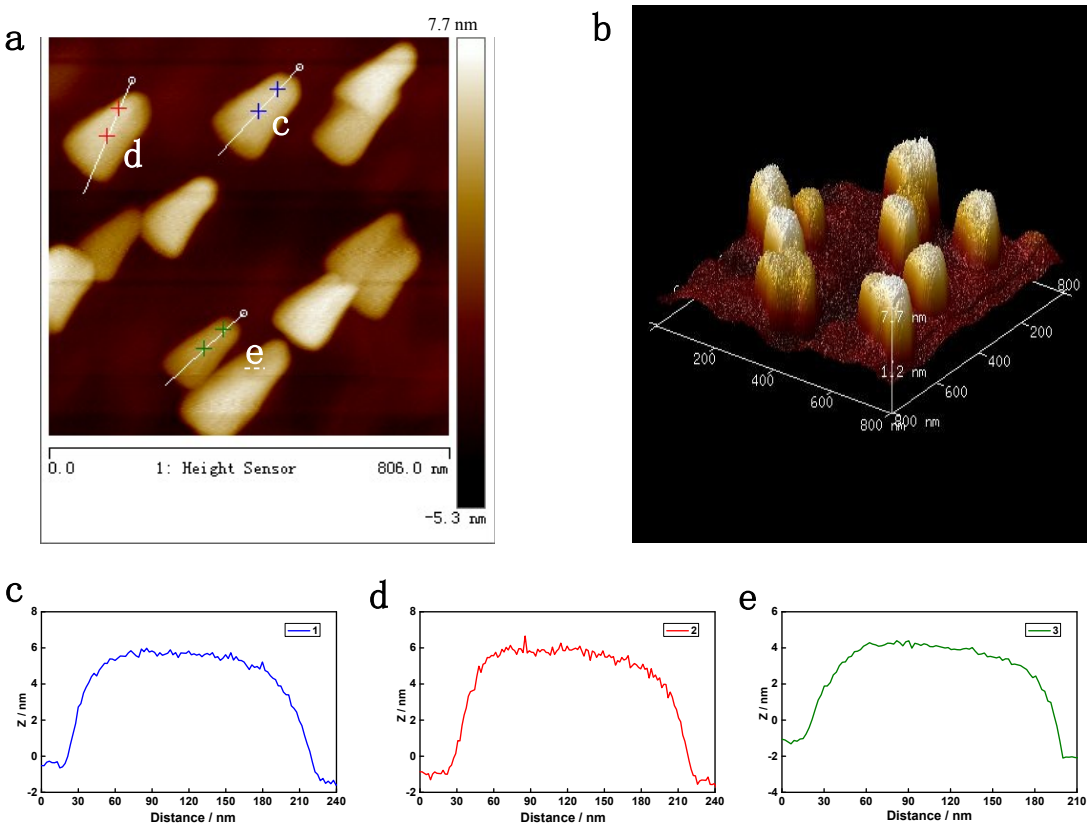

Figure S5. Typical AFM and 3D AFM images of the electrolyzed sample under 2.8 V at 900 °C for 8h (a,b). The thinness at different locations (c-e).