

Supporting Information

Photolithography tailored undulating configuration to confine nanostructures on microtubes via “stress-induced” effect for boosting sodium ion storage

Dose/kGy	Degree of cellulose polymerisation	X-Ray Crystallographic Index/%	Carbonyl content /(mol/kg)	Carboxyl content /(mol/kg)
0.0	4400	76	0.00	0.002
0.83	3100	-	0.01	0.002
8.3	880	75	0.05	0.005
42	320	-	0.22	0.015
83	210	77	0.36	0.023
417	79	-	1.30	0.070
833	56	77	2.66	0.139

Table S1 Effect of gamma irradiation on the physical and chemical properties of cellulose

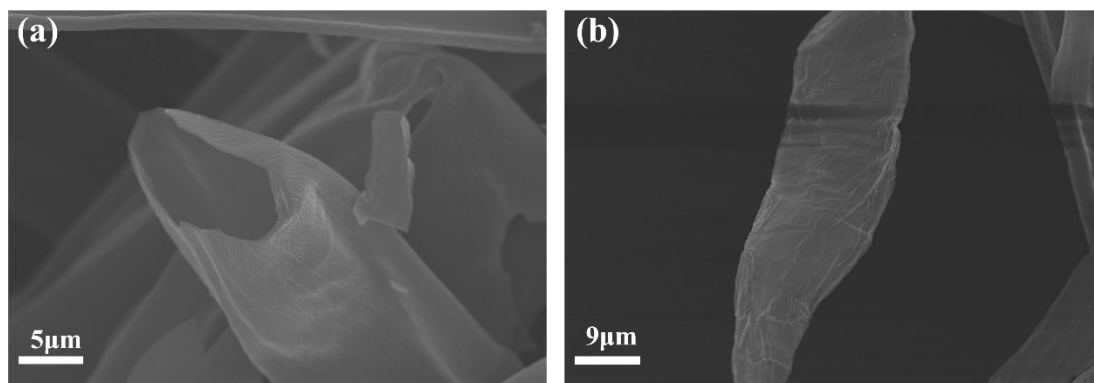


Figure S1. SEM images of the morphologies of a) γ -30 fiber, b) γ -100 fiber.

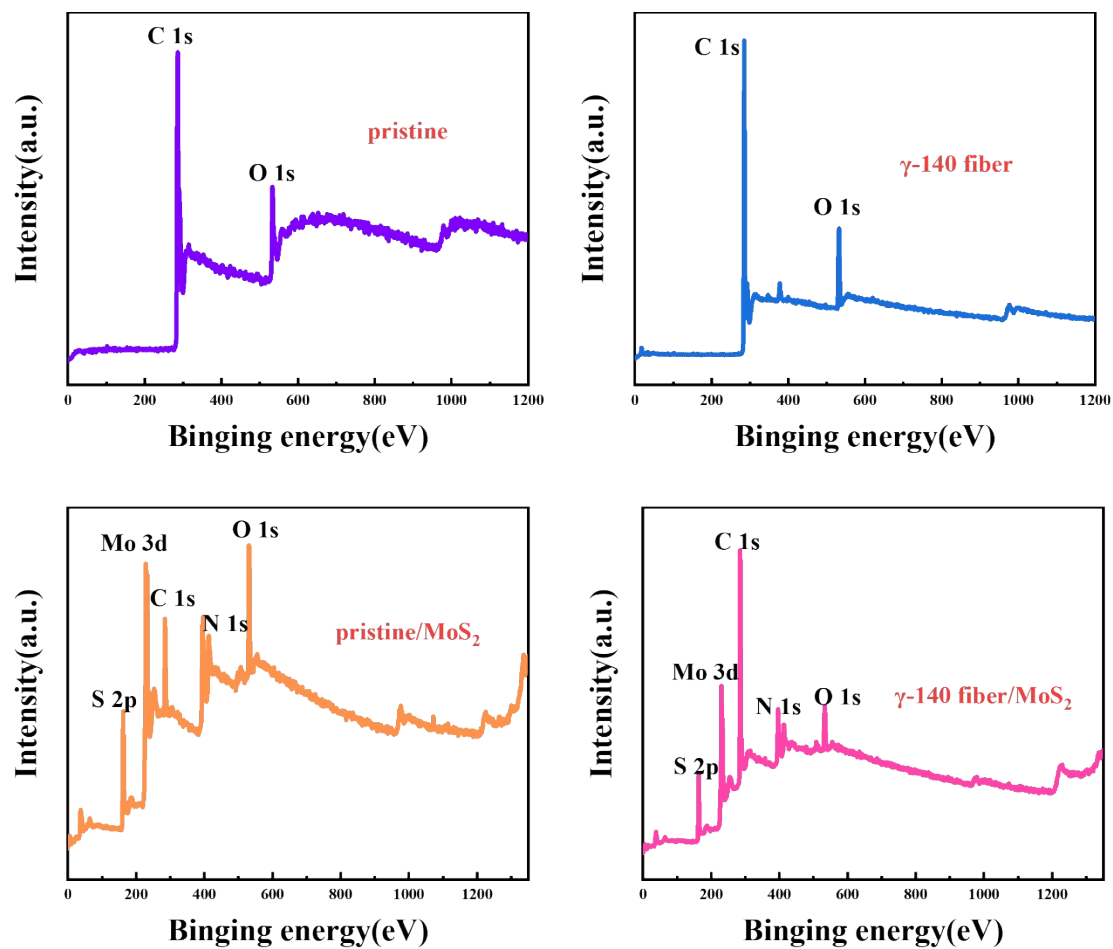


Figure S2. The XPS survey spectra.

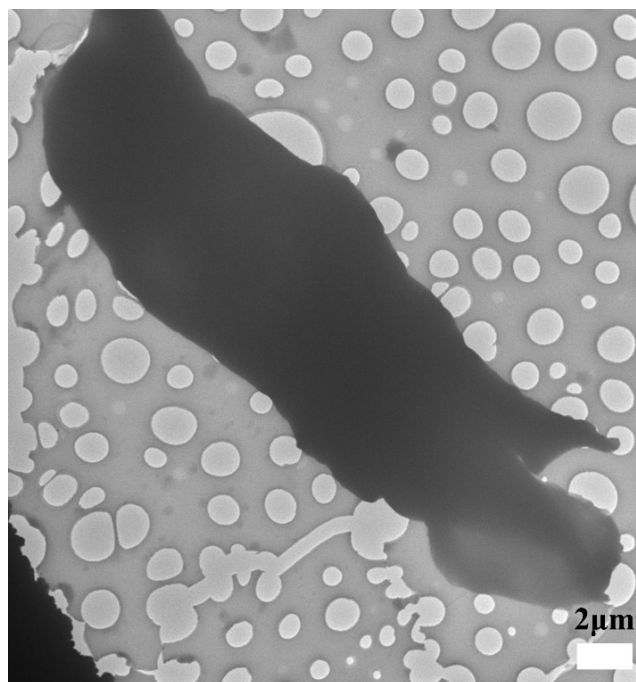


Figure S3. TEM image of γ-kapok fiber.

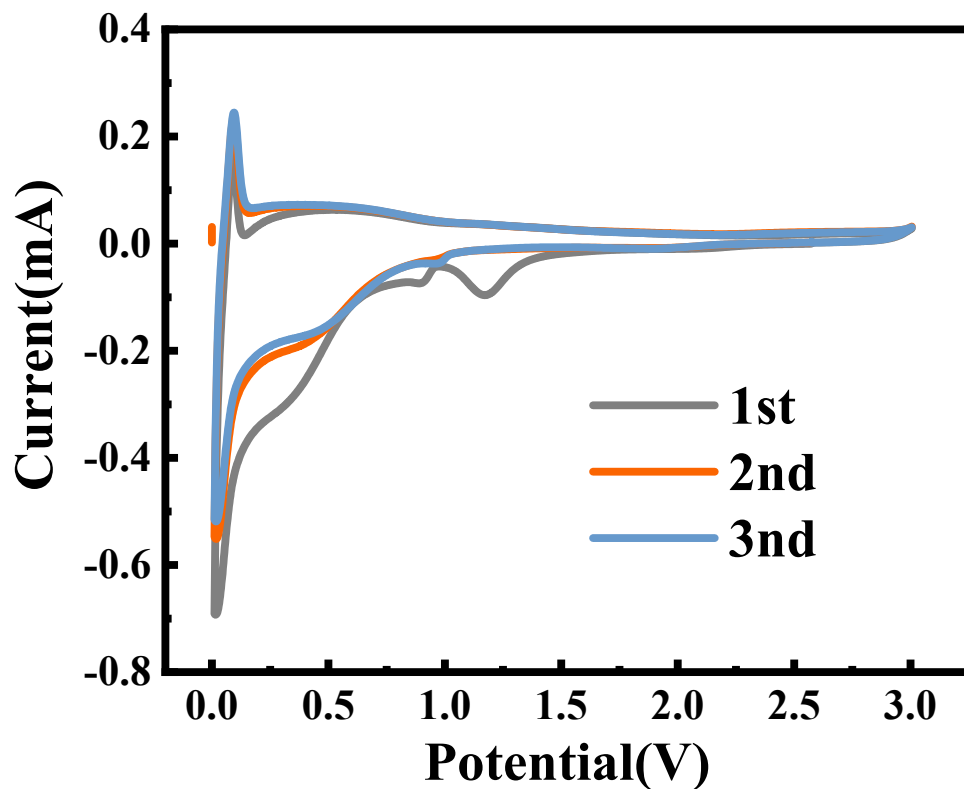


Figure S4. CV curves of pristine fiber/MoS₂

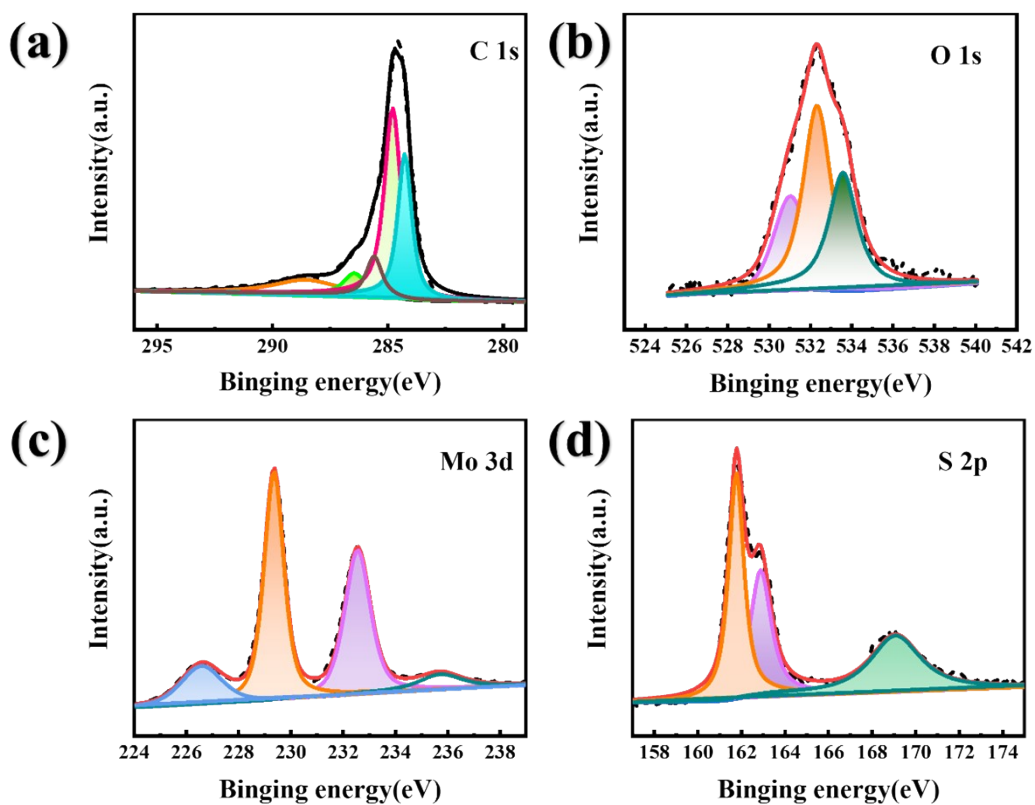


Figure S5. The XPS spectra of γ -140 fiber/MoS₂

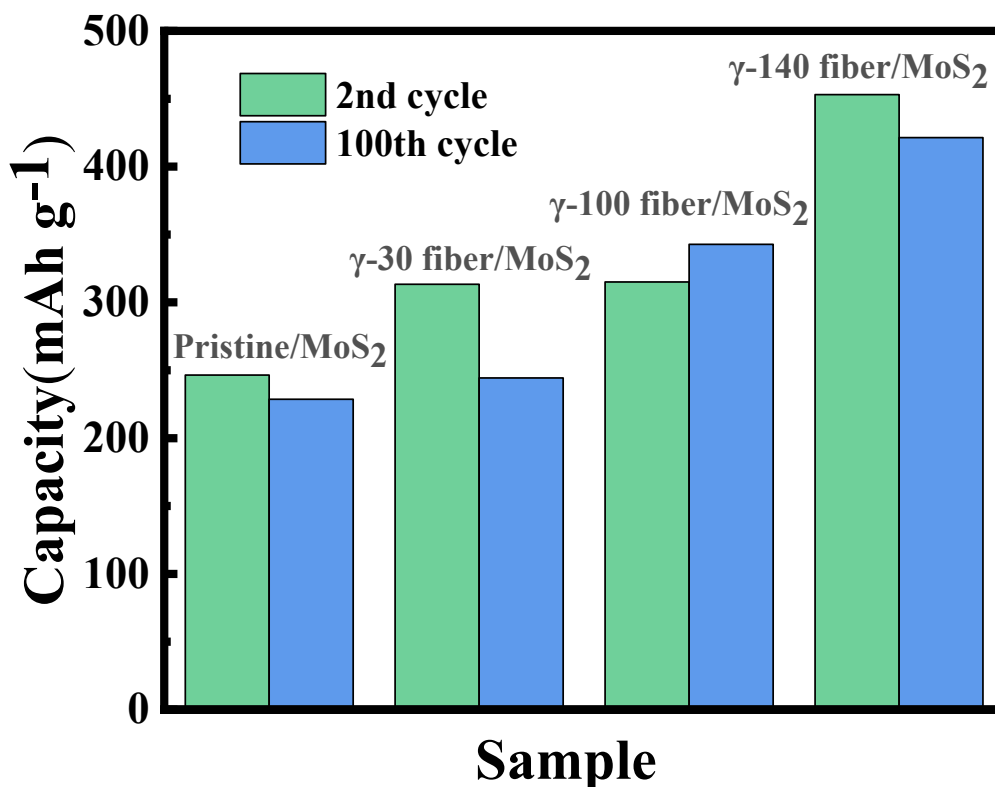


Figure S6. The reversible capacity of the three electrodes at 100th cycle compared to 2nd cycle.

Materials	Capacity (mAh g ⁻¹)	Current (A g ⁻¹)	Ref .	Capacity (mAh g ⁻¹)	Cycles	Current (A g ⁻¹)
Co-doped 1T-MoS ₂	59.4,422.8,390.4, 360.1,319.1,282.2, 238.2,235.9	0.2,0.5,1,2, 5,10,20,25	1	218.6	8,240	5
Few-layer MoS ₂	430,23,413,398, 374	0.1,0.2,0.5,1,2	2	390	300	1
MoS ₂ /C composites	320,21,0.1	0.1,1,0,2.0	3	256	200	1
Petal-like MoS ₂	853,788,728,530, 399,229	0.1,0.5,1,2,5,1 0	4	624	400	5
Mesoporous MoS ₂ /C	481,456,406391, 339,312,244	0.1,0.3,0.5,1.0, 5.0,10.0,20.0	5	390	2500	1
MoS ₂ @ Carbon Tubes	520,470,400,350, 300,210,190	0.1,0.2,0.5,1,2, 5,10	6	300	1000	2

SMS@C	568.4,513.3,472.2 ,422.4,320.9,303. 4	0.1,0.2,0.5,1,2, 5,10	7	465.6	100	1
MoS ₂ -N,P-Co-doped	413,393,366,301, 261,226	0.05,0.1,0.2, 0.5,1,2	8	13	500	5
MoS ₂ coated on carbon fibers	288,268,241,225	0.2,0.3,0.5,1	9	60	280	1
MoS ₂ /C Hierarchical Tubular	563.5,520.5,489.4 ,452.9,425.1,401. 3	0.2,0.5,1.0,2.0, 5.0,10	10	484.9	100	2
MoS ₂ -3D interconnected carbon nanofiber	500,488,440,410, 360,285,210	0.1,0.2,0.5,1,2, 5,10,20	11	260	250	0.05
MoS ₂ /carbon microspheres	412,390,349,318, 285,232,143	0.1,0.2,0.5,1,2, 4,5	12	346	280	1

Table S2 Comparison of the electrochemical performance of anodes in this work with previously reported sodium ion battery anodes.

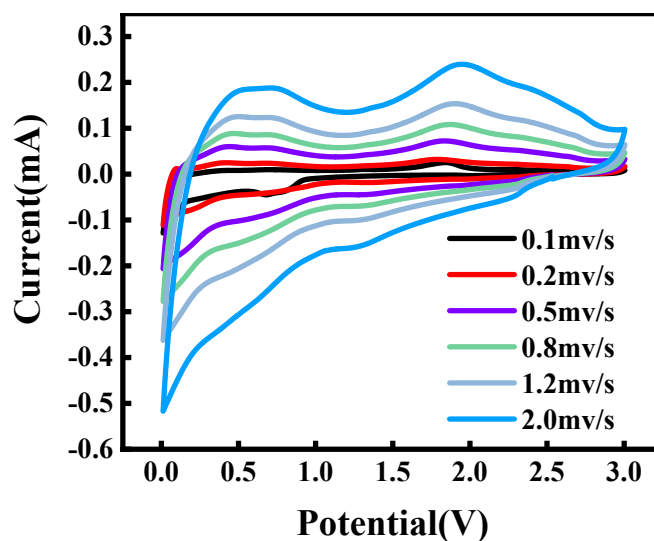


Figure S7. CV curves of γ -140 fiber at stepwise scan rates from 0.1 to 2.0 mV s^{-1}

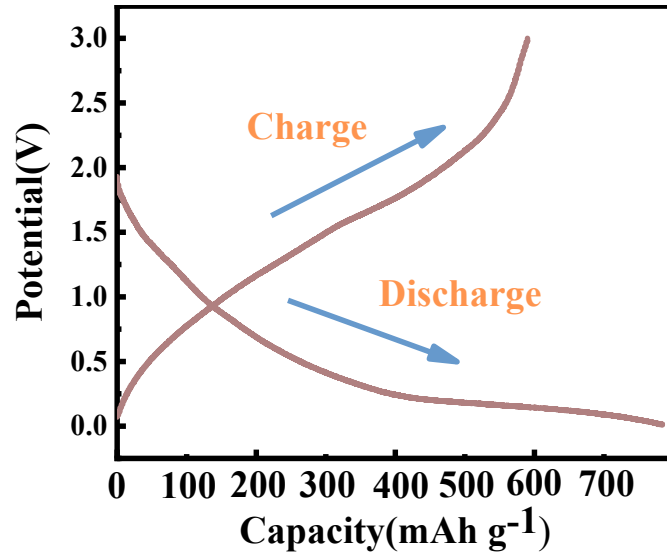


Figure S8. Charge-discharge profiles of γ -140 fiber

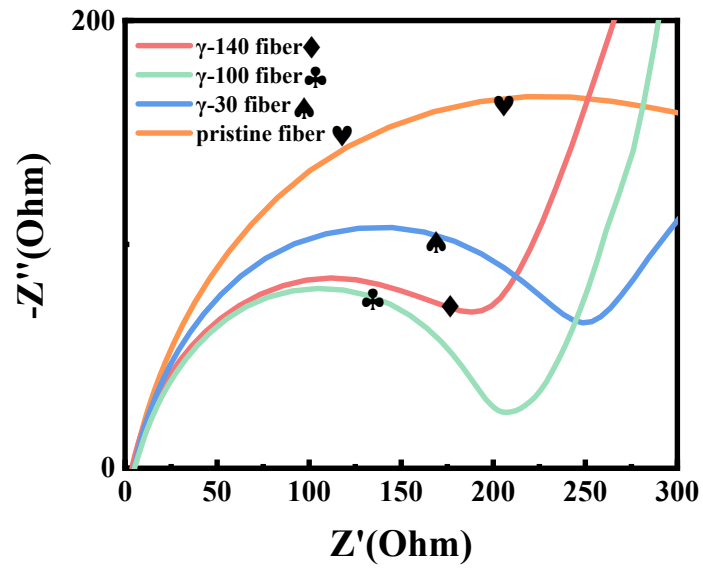


Figure S9. Details of the Nyquist plots

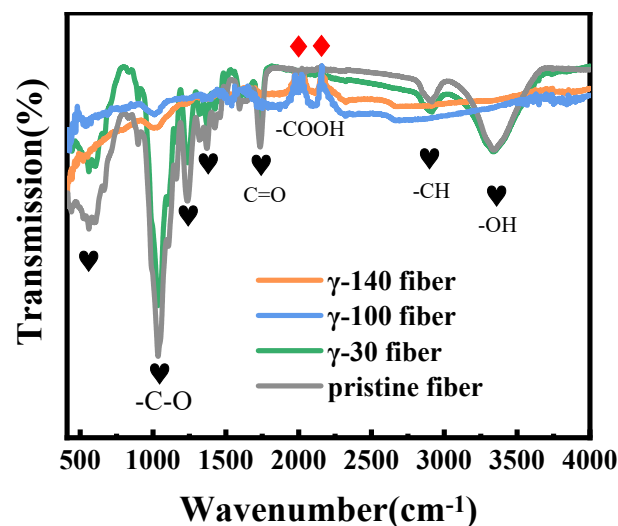


Figure S10. Details of the FTIR spectra

References

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