Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting information

Uniform and dendrite-free zinc deposition enabled by in-situ formed $AgZn_3$ modified Zn surface for zinc metal anode

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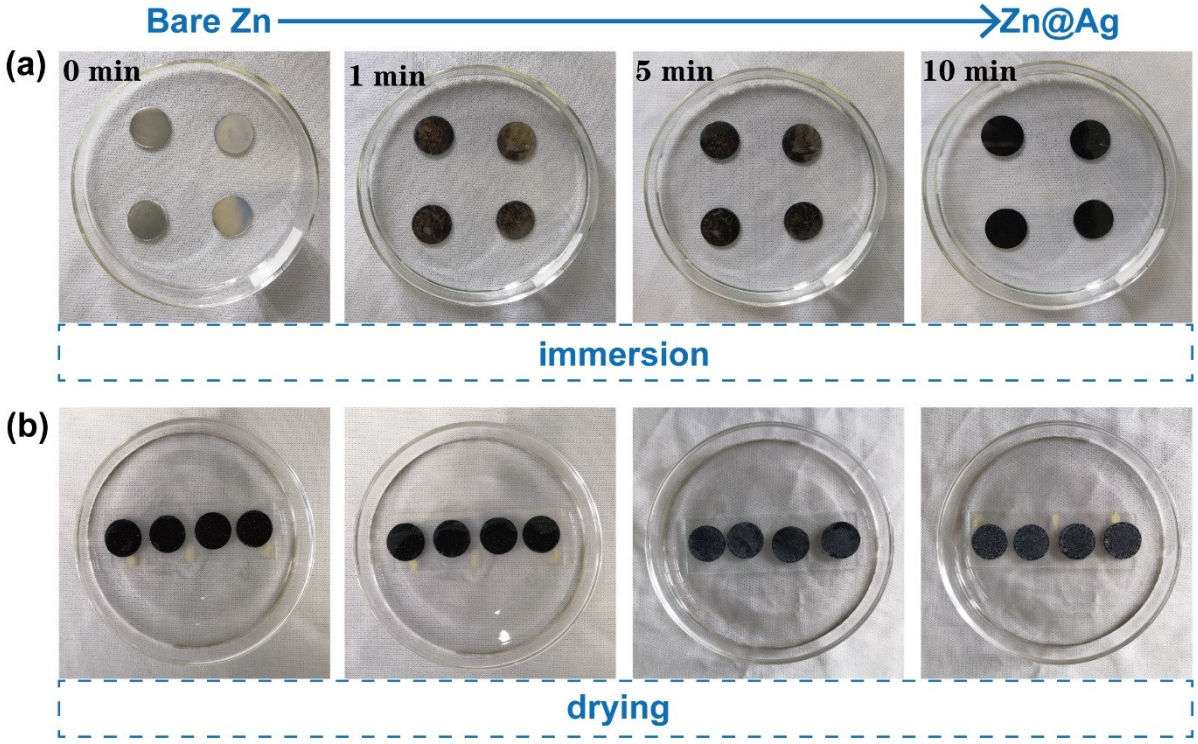


Figure S1: Photograph of preparation process of Ag coated Zn foil.

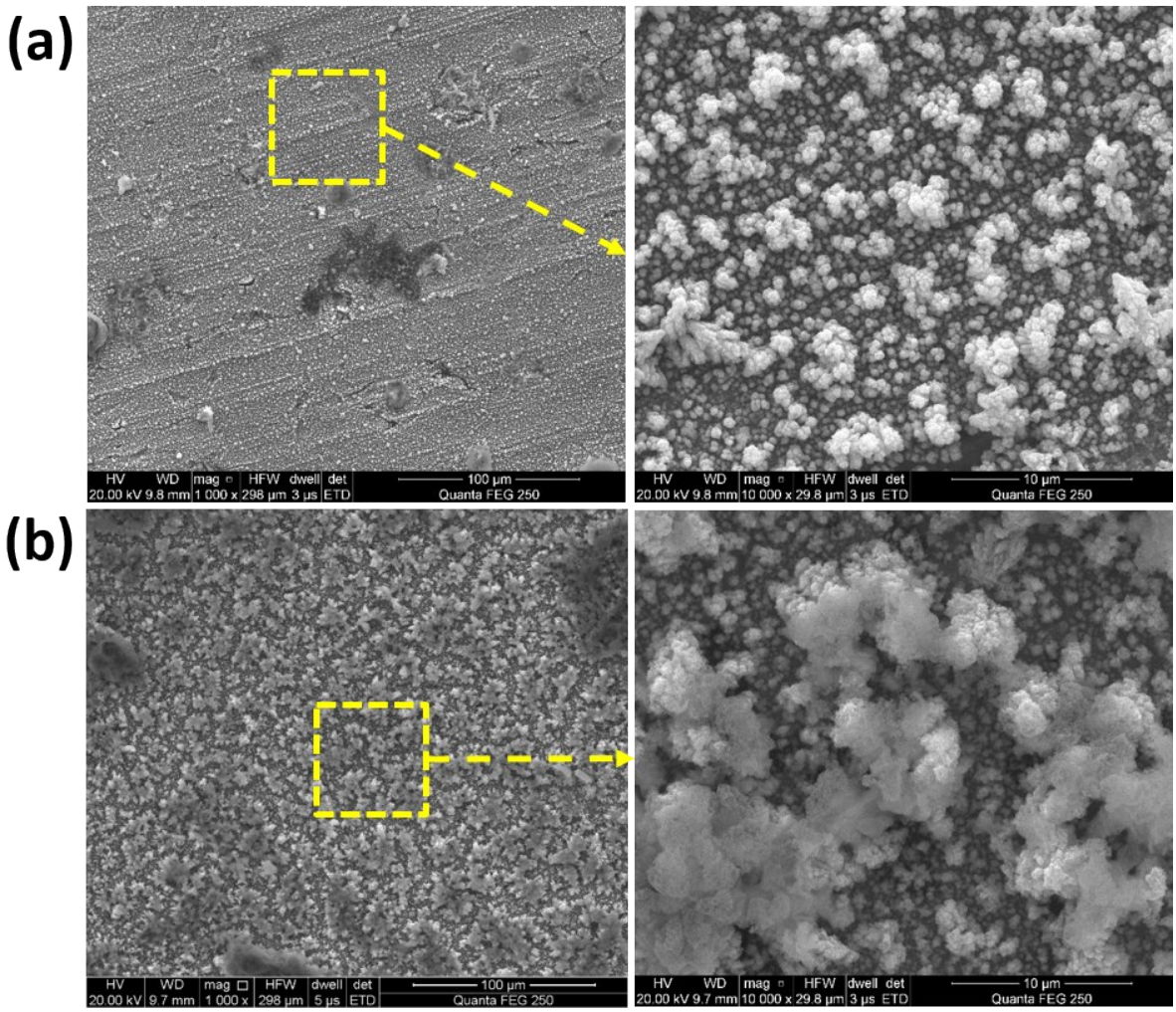


Figure S2: SEM images of Ag coated Zn foil at different immersion time: (a) 15min, (b) 18min.

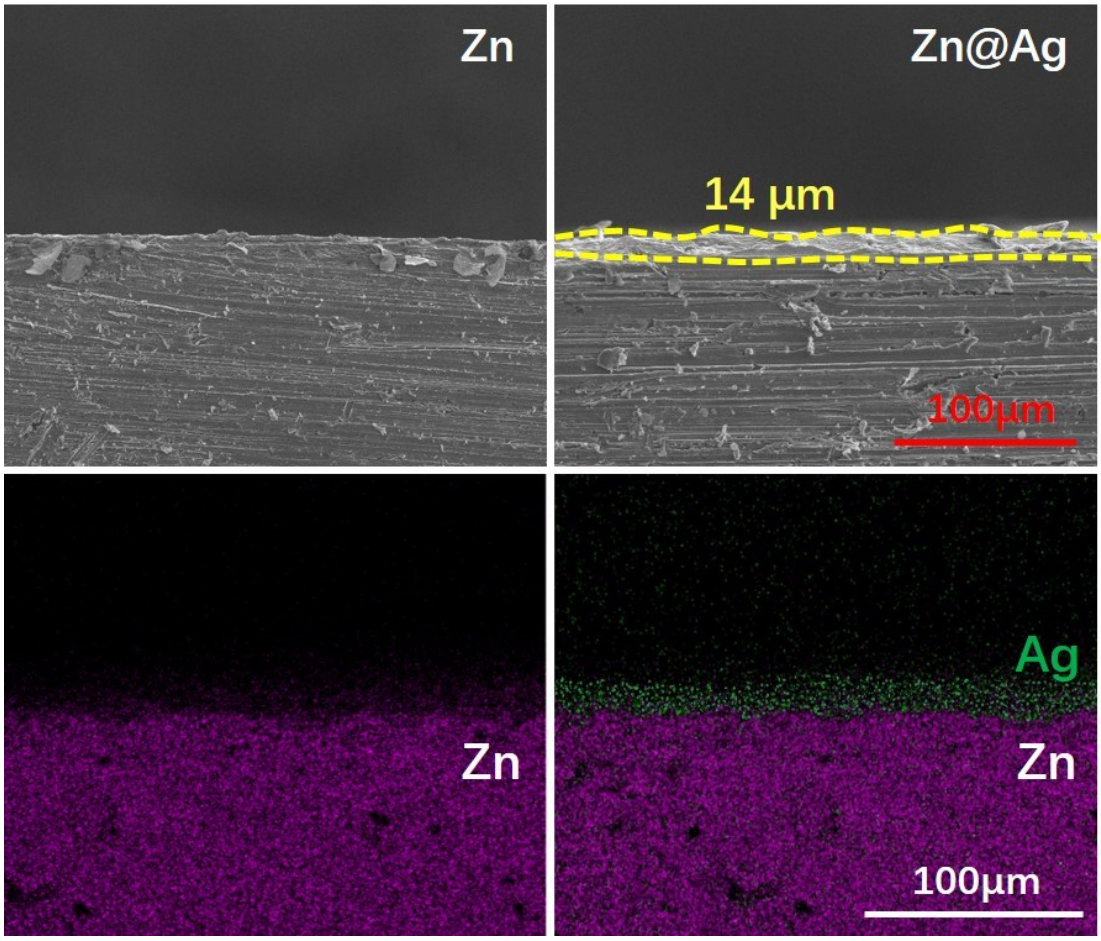


Figure S3: Cross-sectional SEM image of Ag coated Zn foil at 10 min immersion time and EDS mapping of zinc and silver elements.

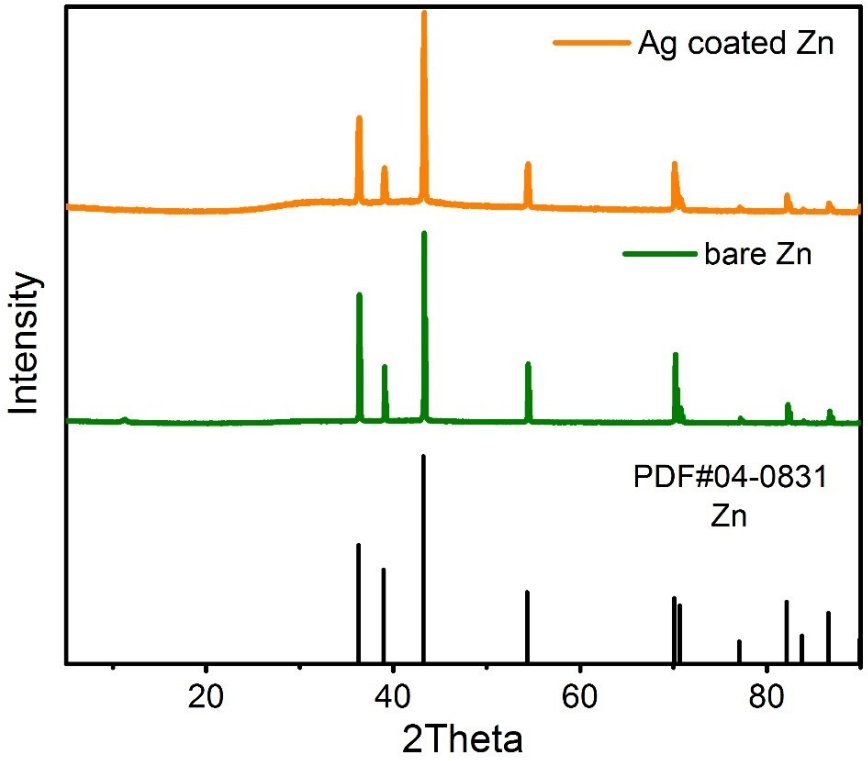


Figure S4: XRD patterns of pristine bare Zn and Ag coated Zn foil.

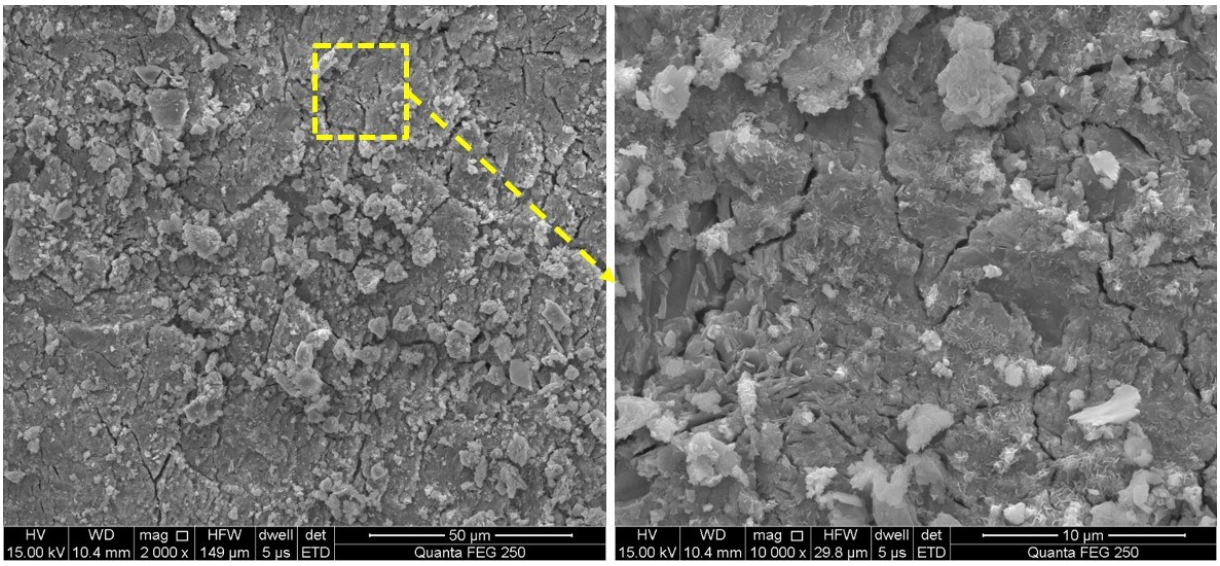


Figure S5: SEM images of Zn@Ag anode after 1000 cycles.

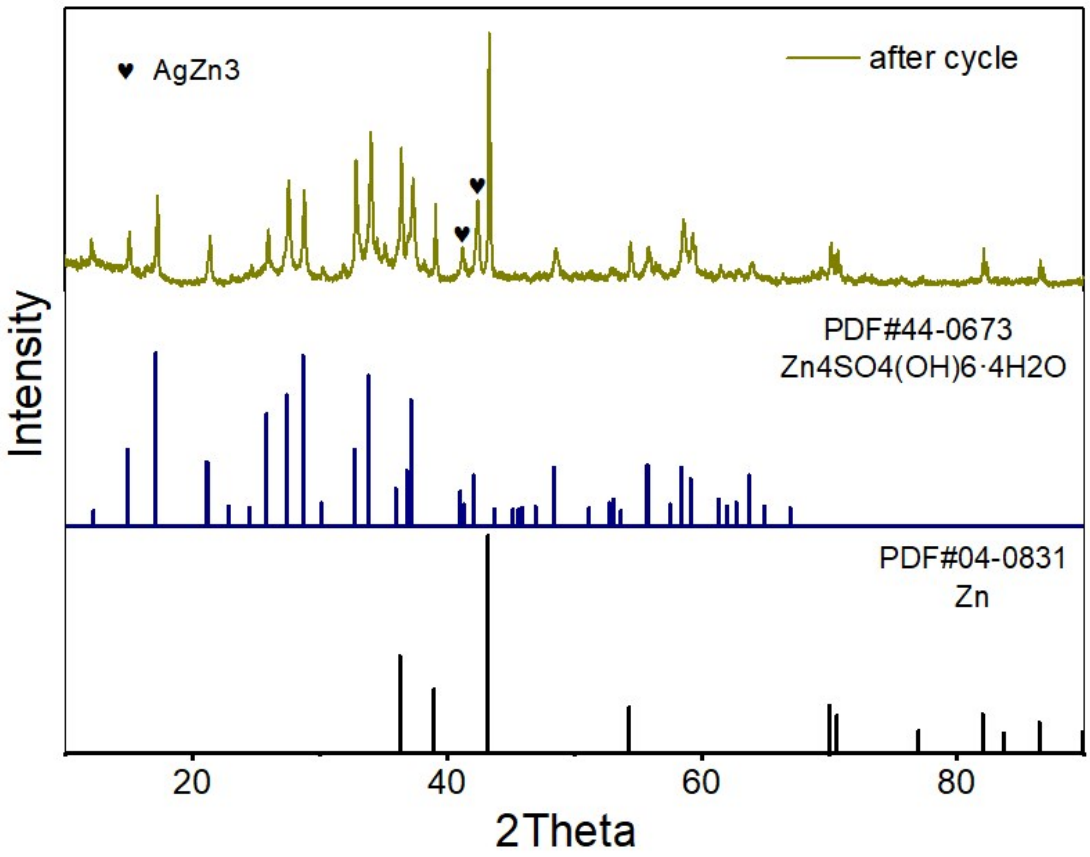


Figure S6: XRD patterns of surface powder on Zn@Ag anode after several cycles.

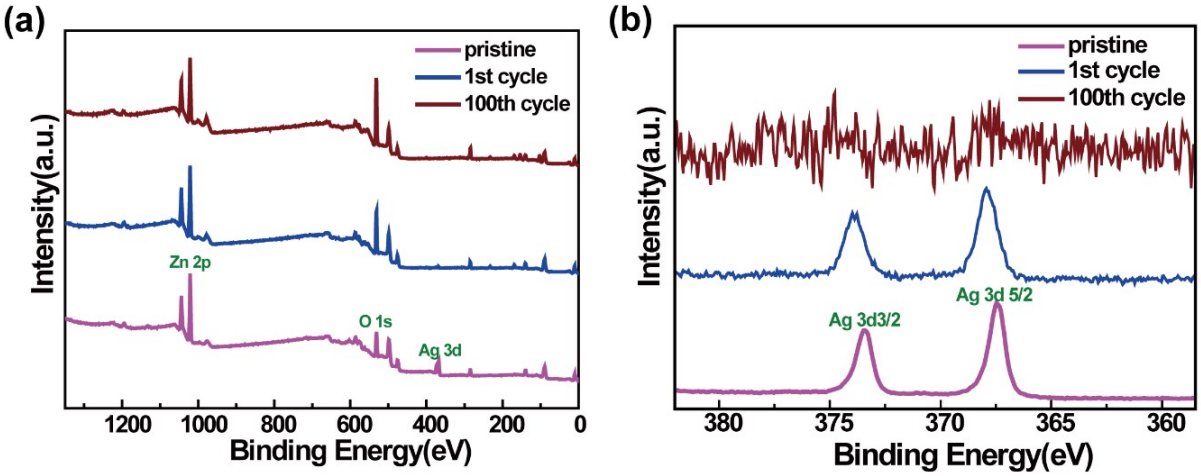
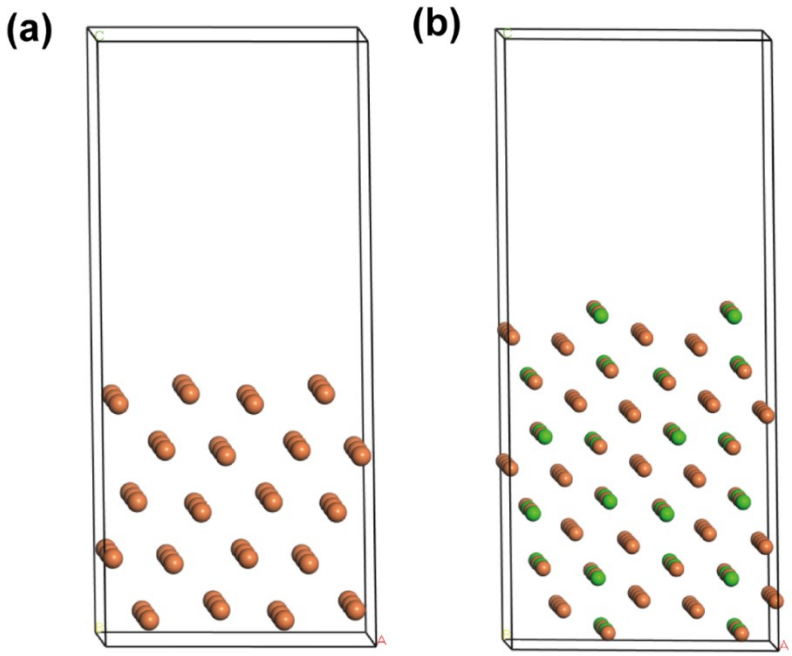
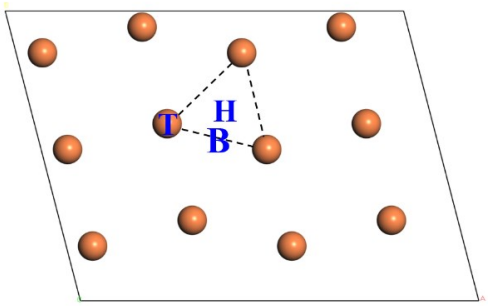


Figure S7: XPS spectrum and Ag 3d spectra of Zn@Ag anode before cycle and after 1st, 100th cycle.

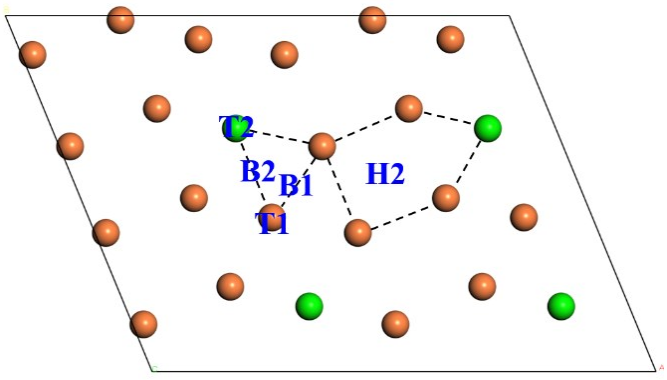


(c)



Species	Sites	Zn(101)
Zn	bridge	-0.20
	hollow	-0.35
	top	-0.26

(d)

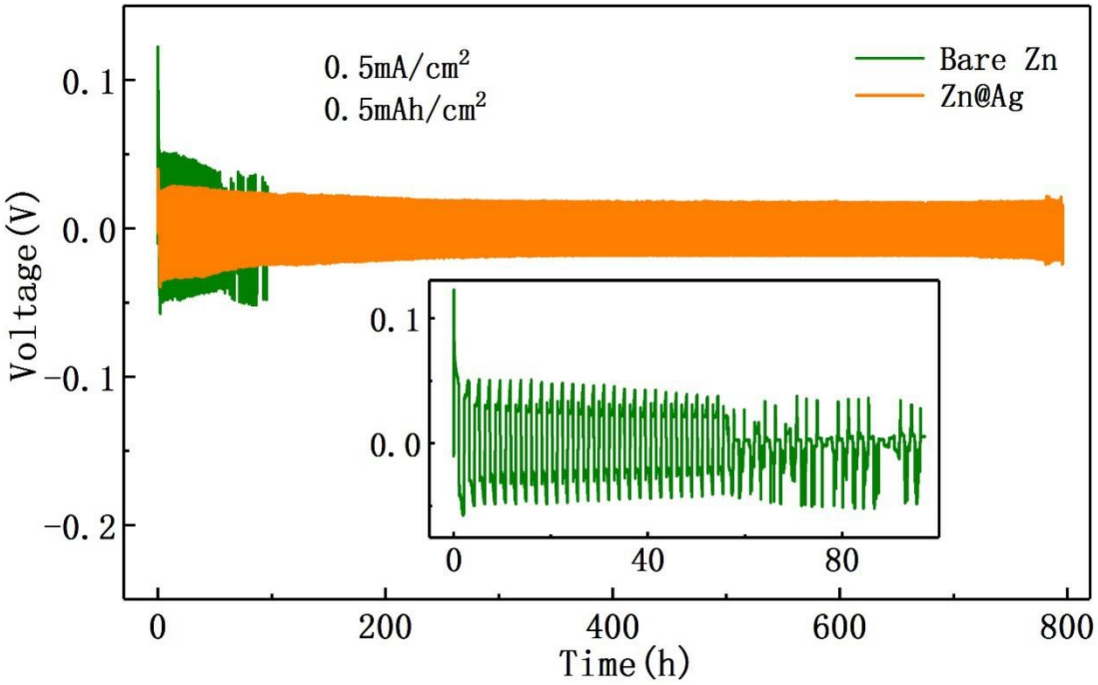


Species	Sites	AgZn3
Zn	bridge	-0.58
	bridge2	-0.56
	hollow1	-0.55
	hollow2	-0.90
	top1	-0.47
	top2	-0.49

Figure S8: Models of zinc (101) slab (a) and $AgZn_3$ (101) slab (b). Top view of Zn (101) surfaces (c) and $AgZn_3$(101) surface(d). The binding sites of bridge, hollow, and top sites were labeled as B, H, and T, respectively. The binding

energy (in eV) of Zn atom on Zn(101) surface(c) and $AgZn_3$(101) surface(d).

(a)



(b)

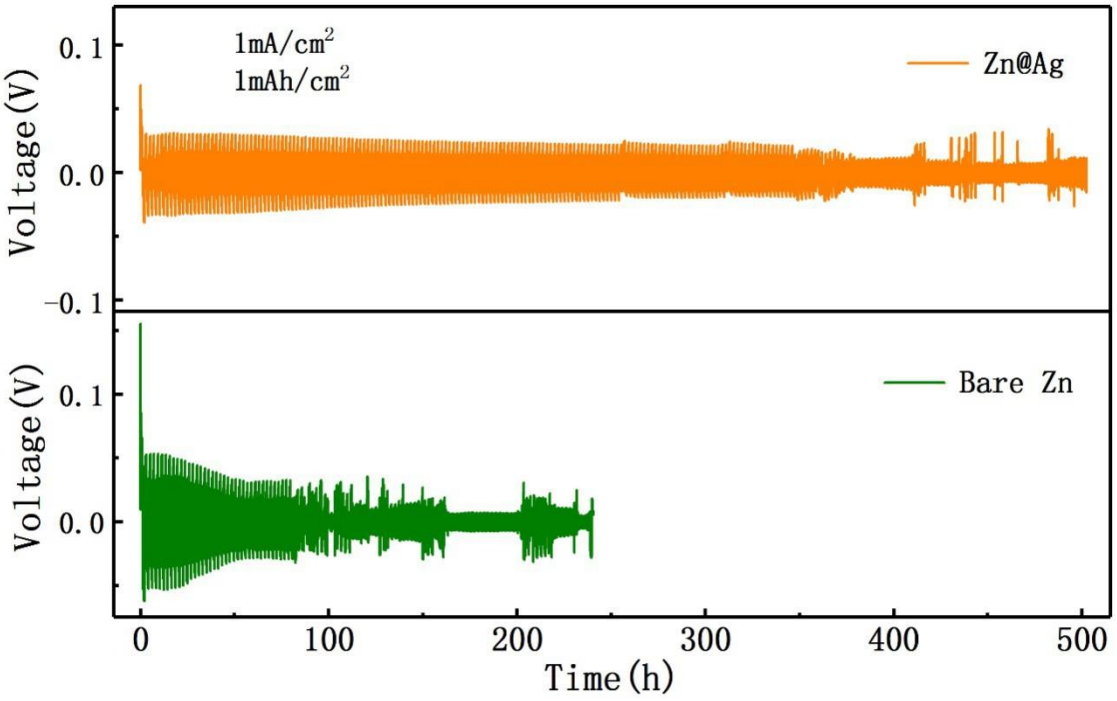


Figure S9: Long-term cycling profiles at 0.5 mA/cm² and 0.5 mAh/cm² in (a)

and 1 mA/cm^2 and 1mAh/cm^2 in (b).

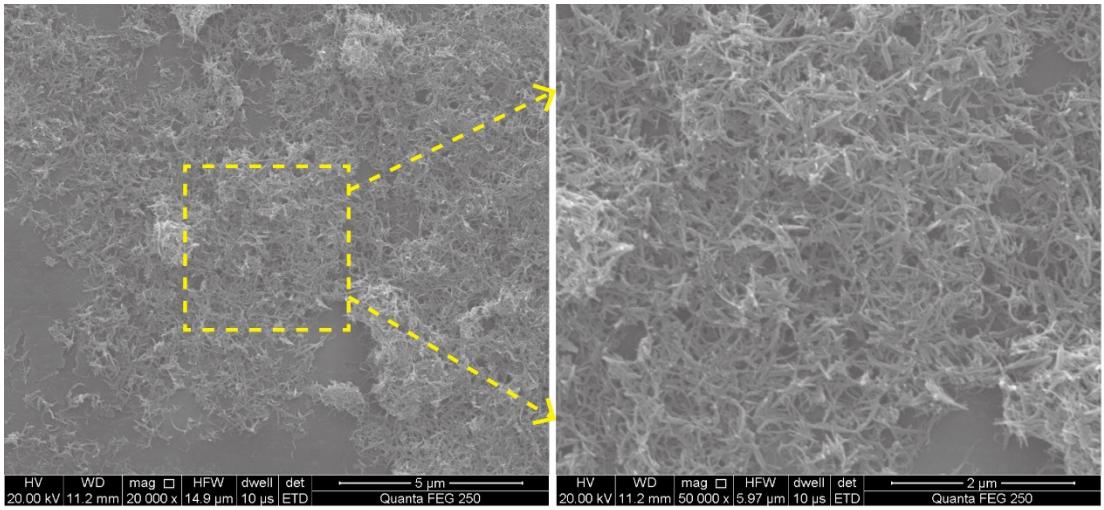


Figure S10: SEM images of CNT/MnO_2 powder.

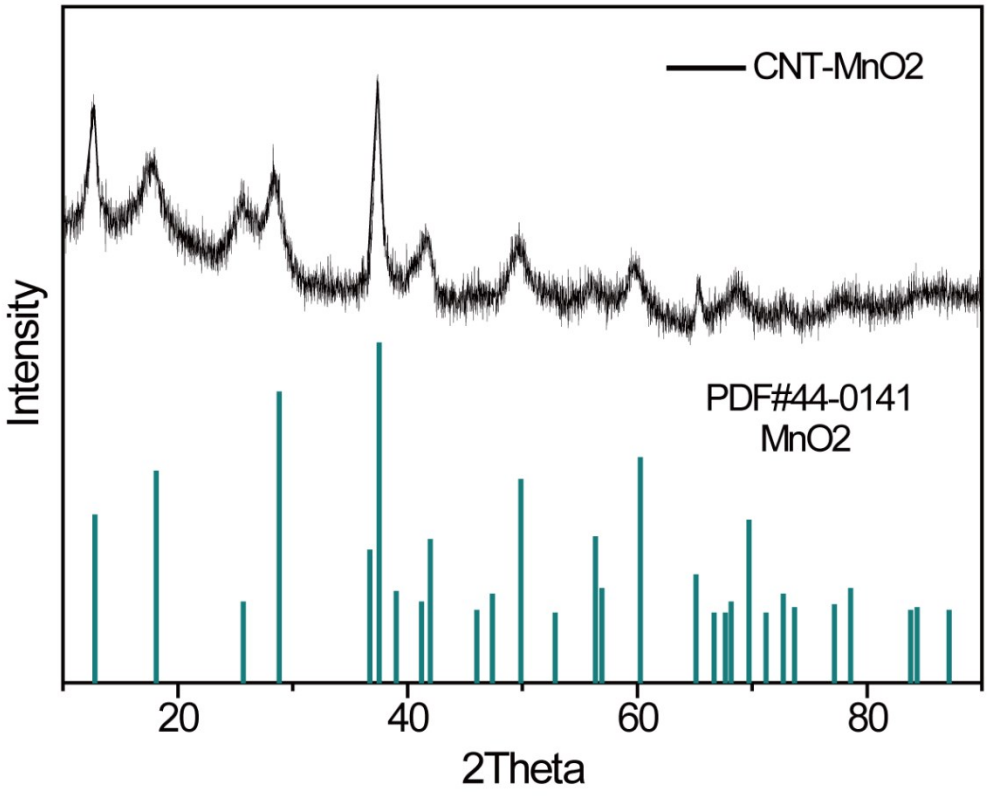


Figure S11: XRD pattern of CNT/MnO_2 composite materials.

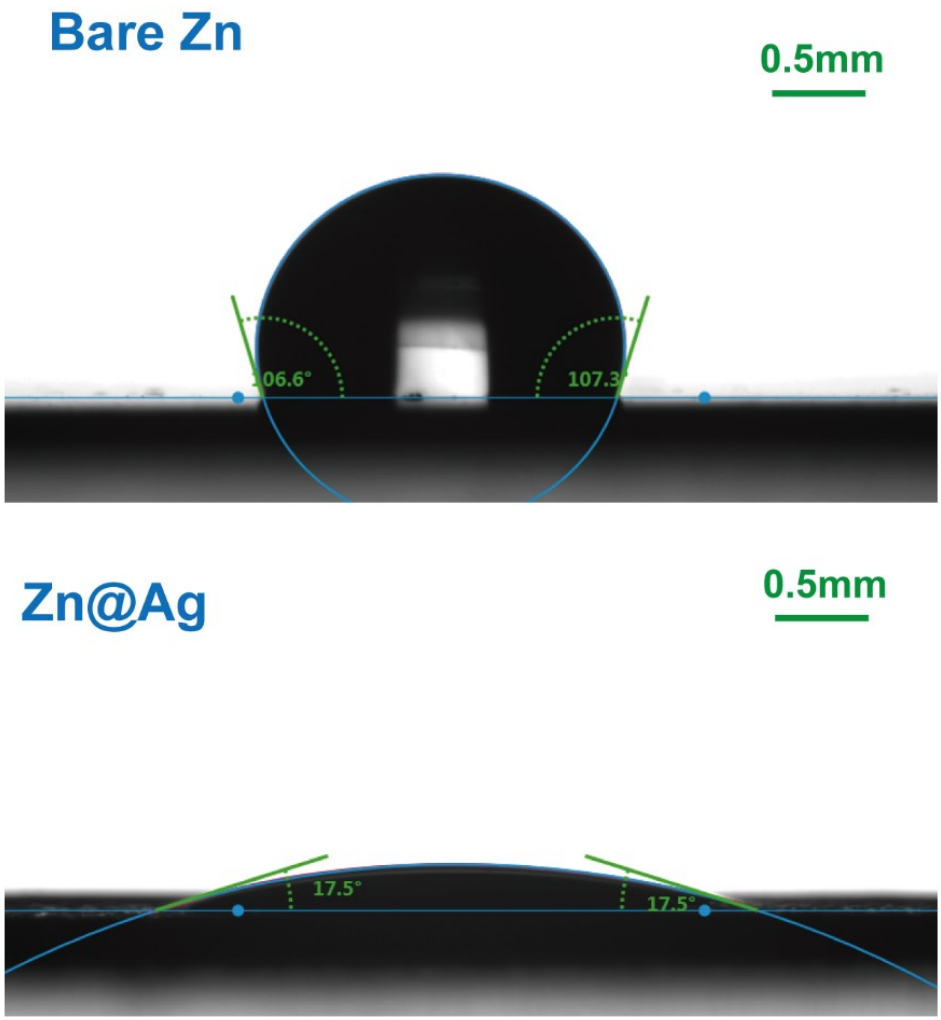


Figure S12: Images of contact angles between the 2 M $ZnSO_4$+0.2 M $MnSO_4$ electrolyte and bare Zn or Ag coated Zn anode.

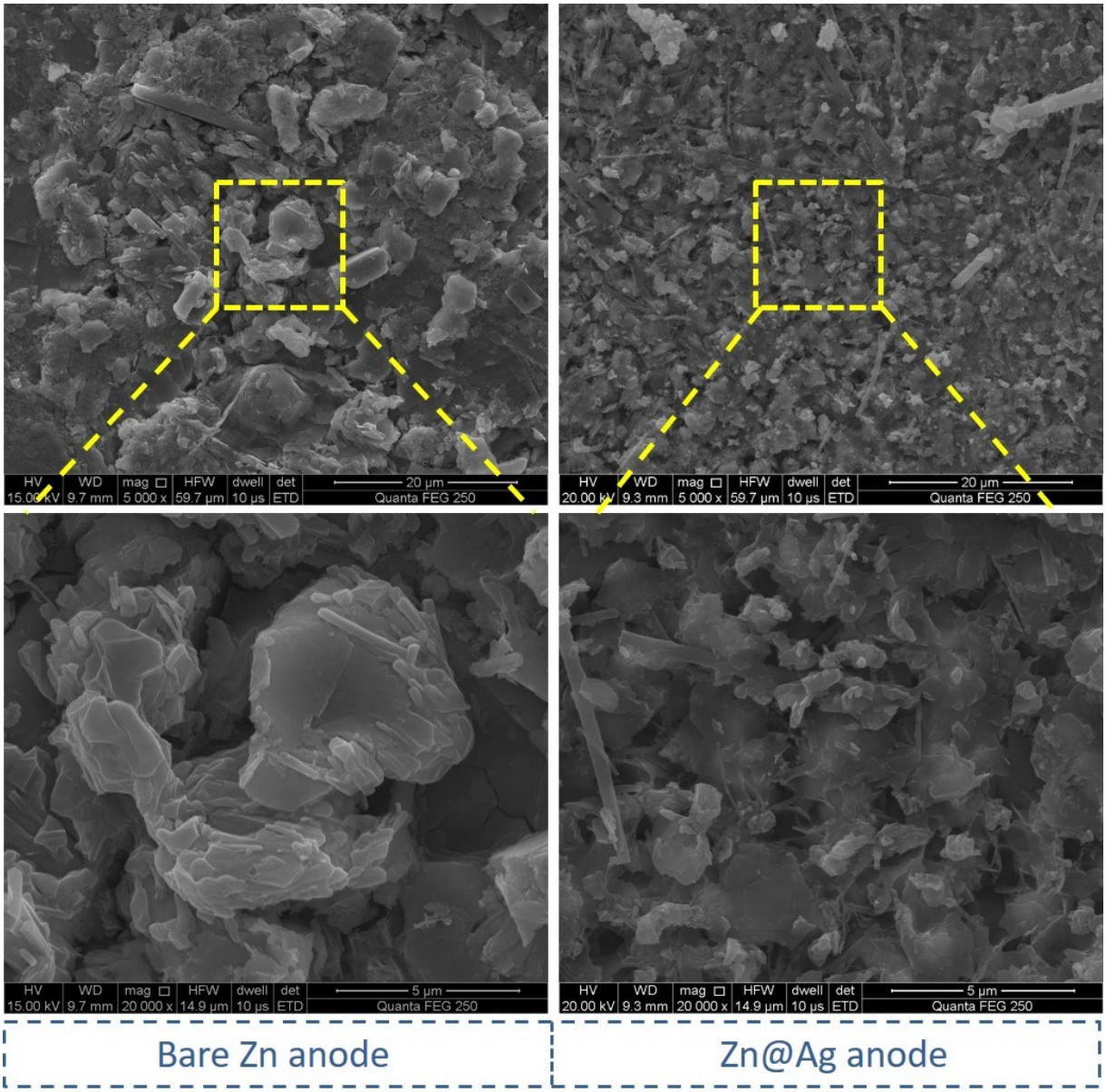
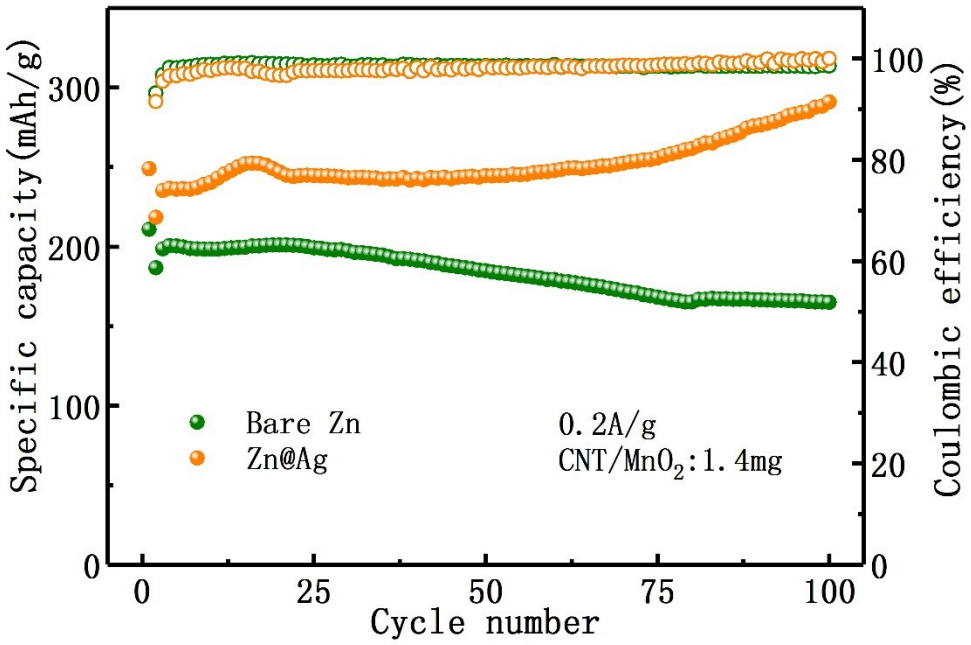


Figure S13: SEM images of bare/coated Zn anode after 100th cycle in full cell at 0.6 mA/cm^2.

(a)



(b)

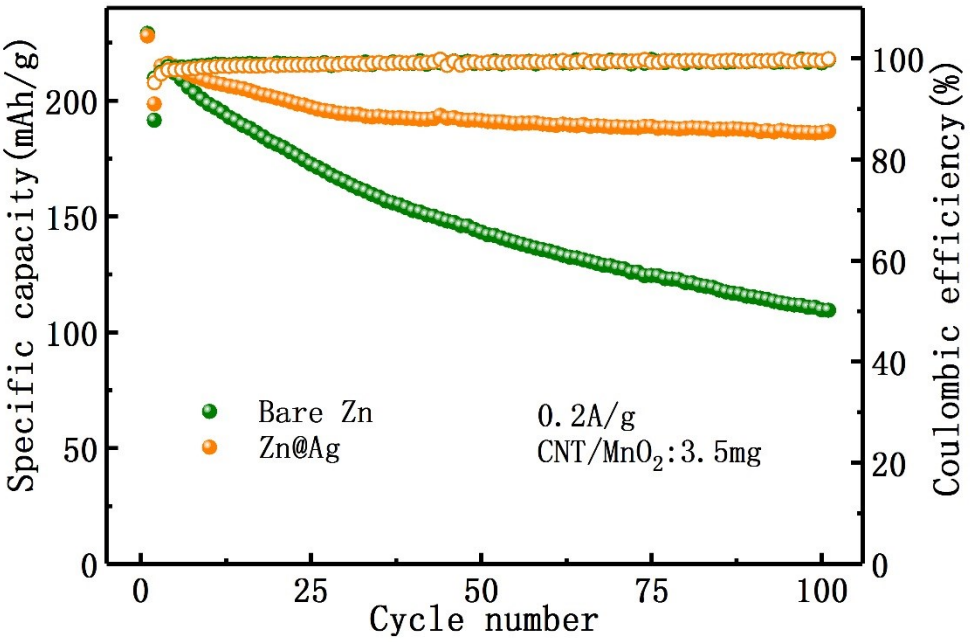


Figure S14: Cycling performance of the full cells with different anodes at 0.2 A/g with 1.4 mg(a) and 3.5 mg(b) CNT/MnO_2