Supplementary Information

Conductive TiN Network-Assisted Fast-Charging of Lithium-Ion Batteries

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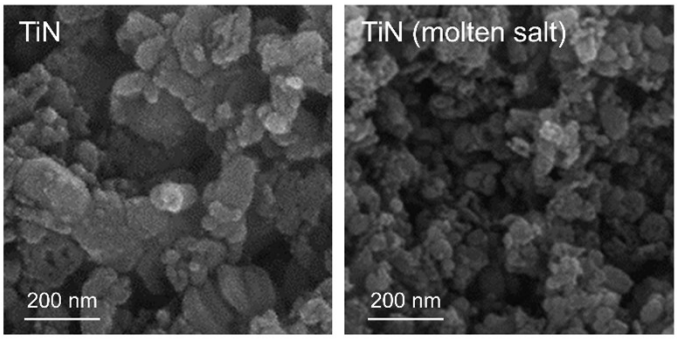

Fig. S1. FESEM images of (a) TiN nanoparticles, and (b) TiN nanoparticles synthesized with molten salt

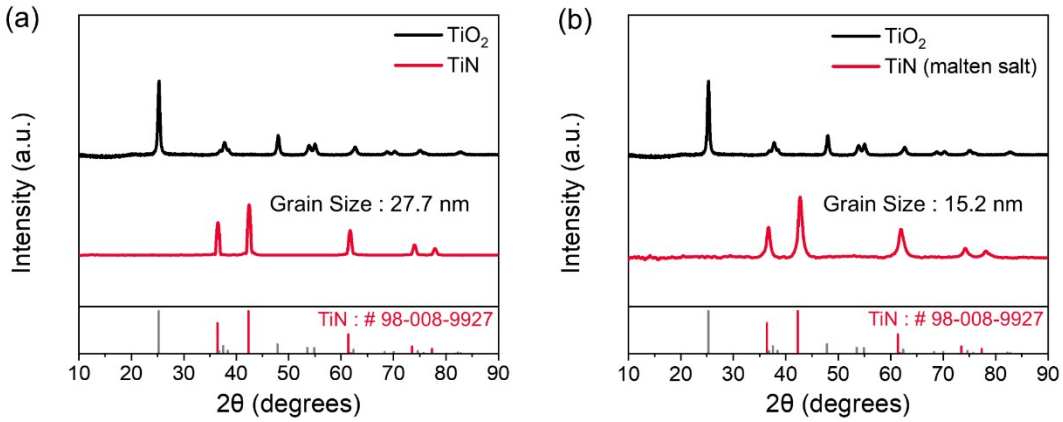

Fig. S2. Powder XRD patterns of TiN nanoparticles, and (b) TiN nanoparticles synthesized with molten salt

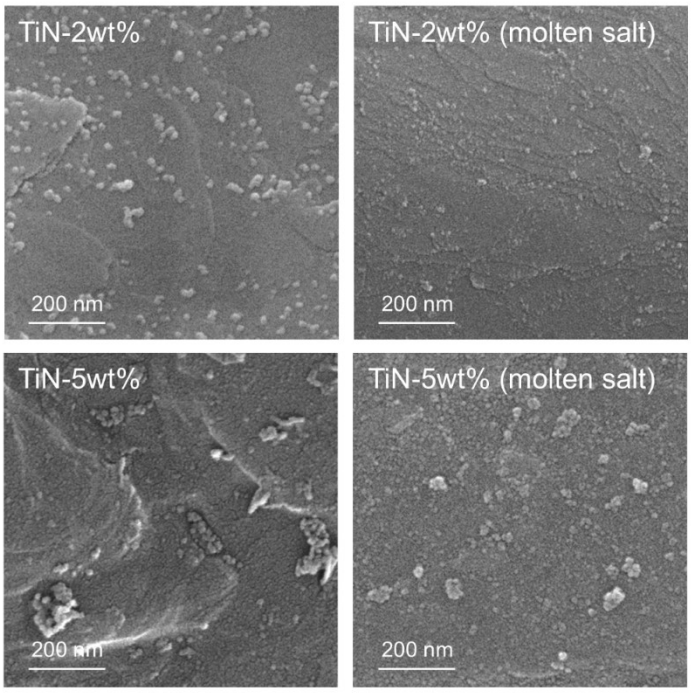

Fig. S3. FESEM images of TiN@AG 2wt%, TiN@AG 2wt% synthesized with molten salt, TiN@AG 5wt%, and TiN@AG 5wt% with molten salt.

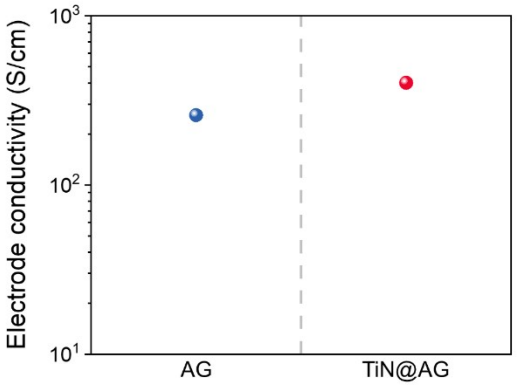

Fig. S4. Comparison of electrode conductivity of the AG and TiN@AG anodes.

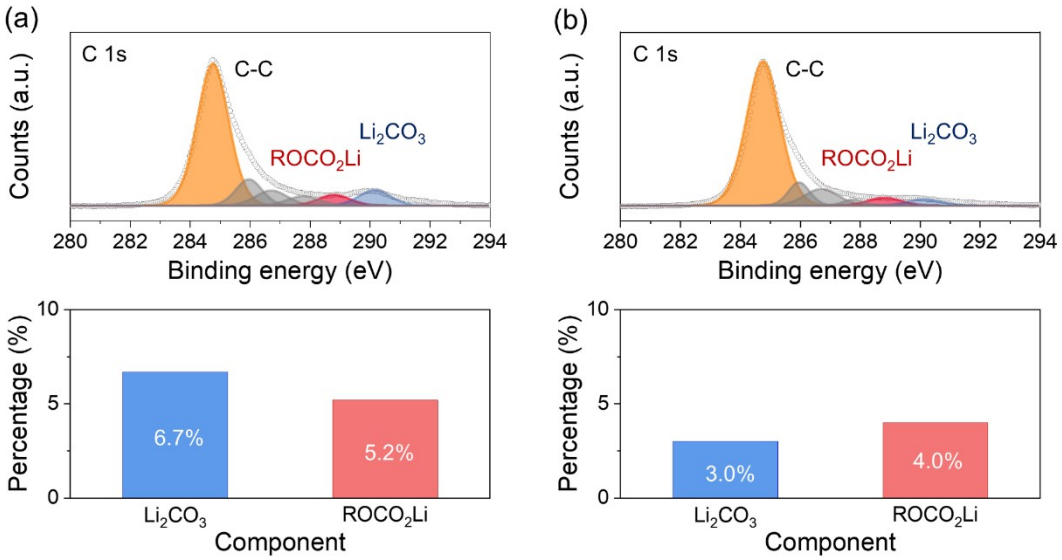

Fig. S5. C 1s XPS profiles and the fraction of Li_2CO_3 and $ROCO_2Li$ in the SEI component after 300th cycle of (c) AG and (d) TiN@AG

Table S1. Fitting results of the Nyquist plots using the equivalent circuit.

Sample	OCV		SOC 50%			SOC 100%		
	R_b (Ω)	R_{ct} (Ω)	R_b (Ω)	R_{SEI} (Ω)	R_{ct} (Ω)	R_b (Ω)	R_{SEI} (Ω)	R_{ct} (Ω)
AG	15.8	144.0	4.5	3.6	13.3	1.1	3.8	11.8
TiN@AG	2.5	36.3	2.0	3.1	12.9	1.2	2.2	3.6

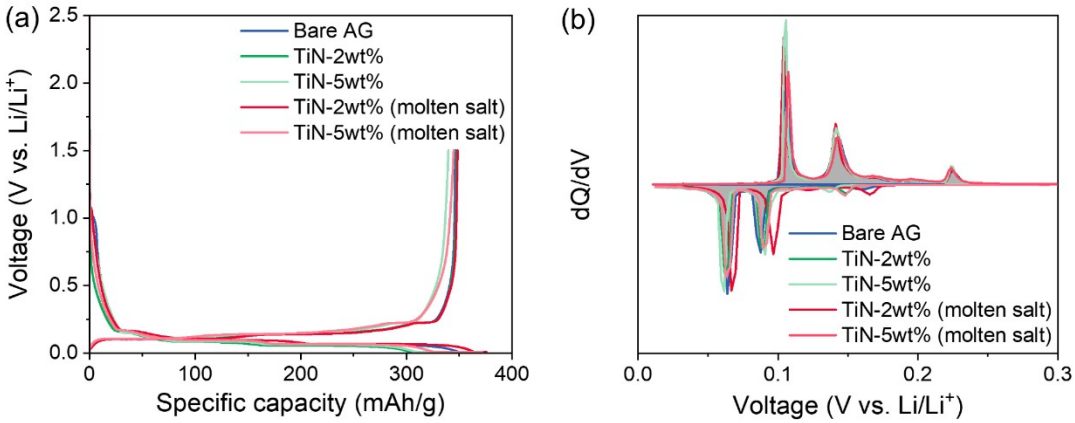

Fig. S6. Electrochemical performances of various anodes: (a) galvanostatic voltage profiles at 0.1C charging and 0.1C discharging, and (b) corresponding differential voltage profiles of the first cycle.

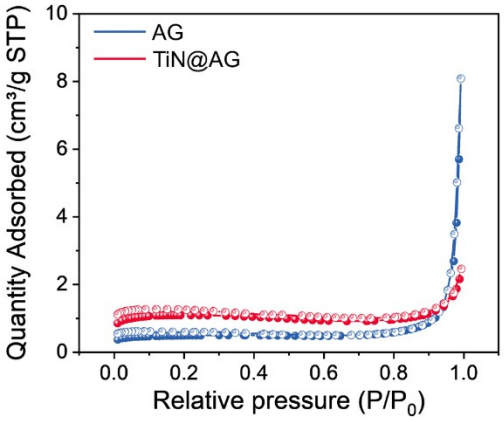

Fig. S7. N_2 adsorption-desorption isotherms of AG, and TiN@AG particles.