

Supporting Information

Multi-functional gum arabic binder for NiFe_2O_4 nanotubes anodes enabling excellent Li/Na-ion storage performance

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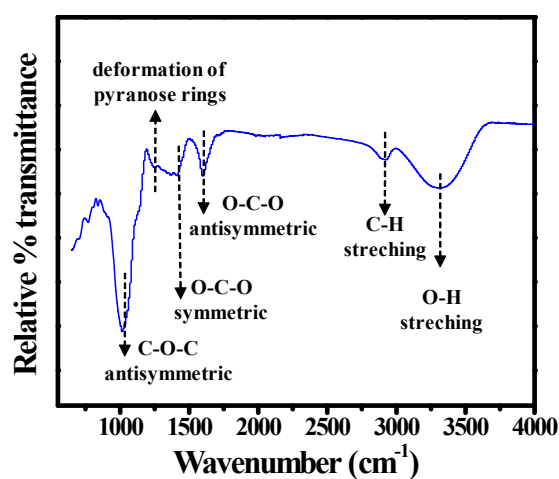


Fig. S1 FTIR spectra of GA.

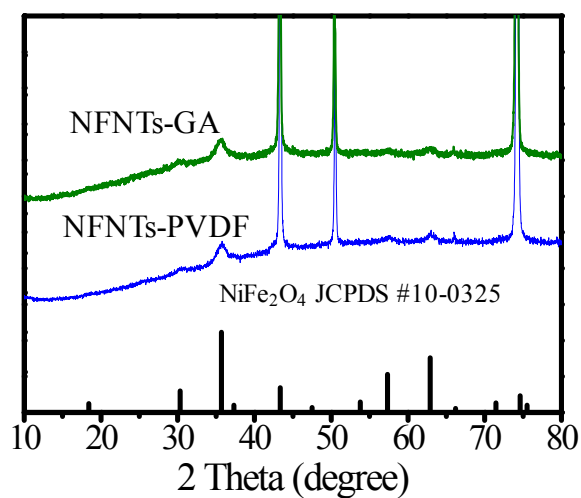


Fig. S2. XRD patterns of fresh NFNTs-GA and NFNTs-PVDF electrode.

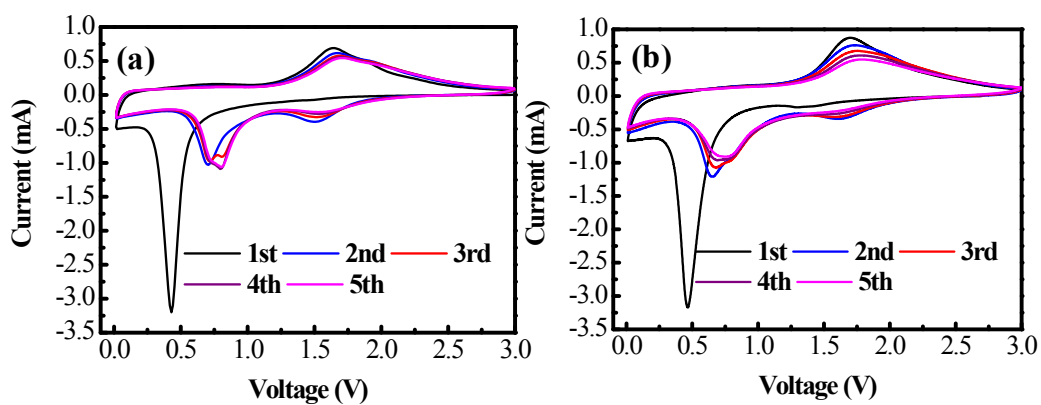


Fig. S3. Consecutive CV curves of (a) NFNTs-GA and (b) NFNTs-PVDF electrode for LIBs at a scan rate of 0.5mVs^{-1} in the voltage range of 0.01-3 V.

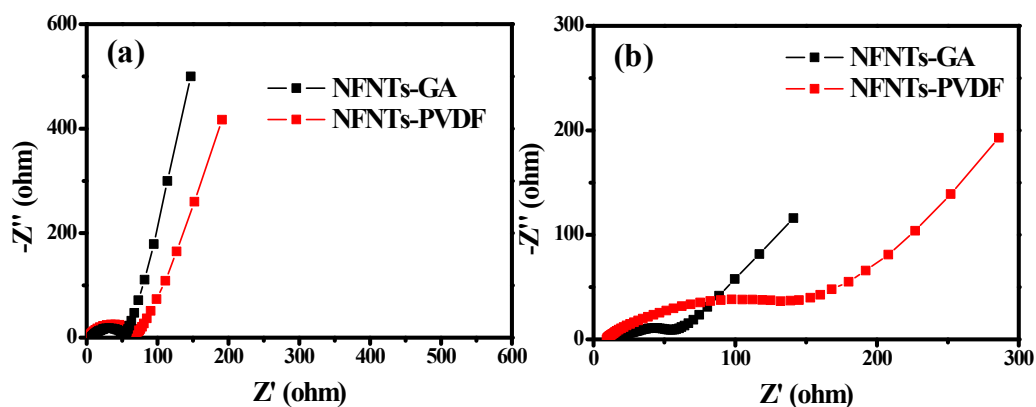


Fig. S4. Electrochemical impedance spectra (EIS): (a) fresh electrodes and (b) the electrodes after 100 cycles for LIBs.

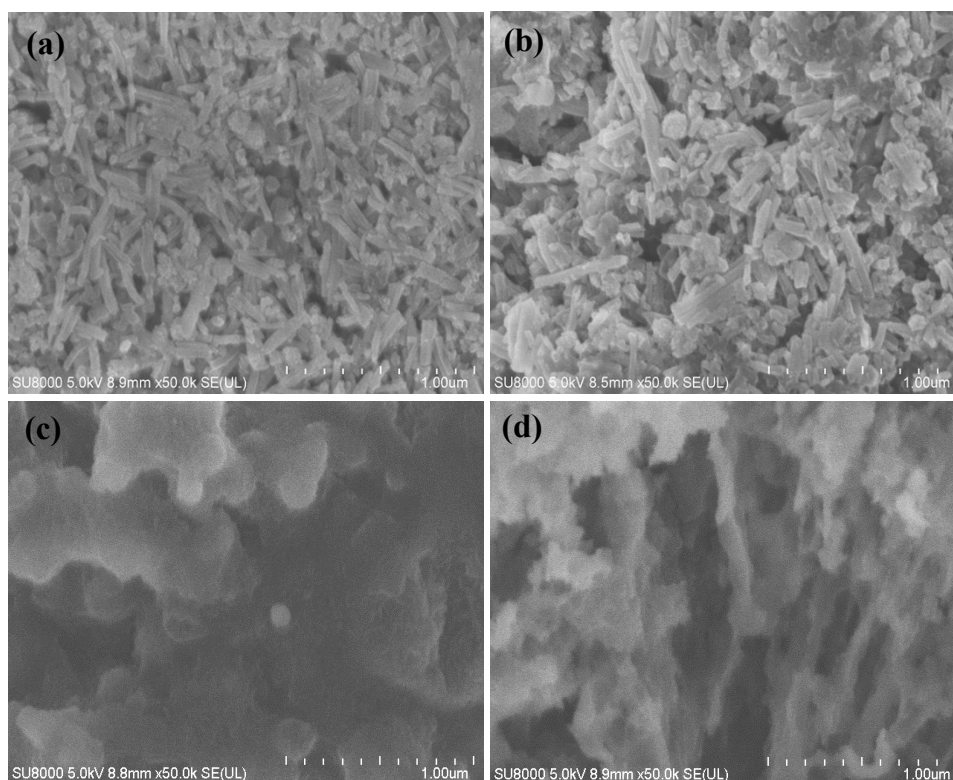


Fig. S5. SEM images of the fresh electrodes: (a) NFNTs-GA and (b) NFNTs-PVDF. SEM images of the electrodes after 100 cycles for LIBs: (c) NFNTs-GA and (d) NFNTs-PVDF.

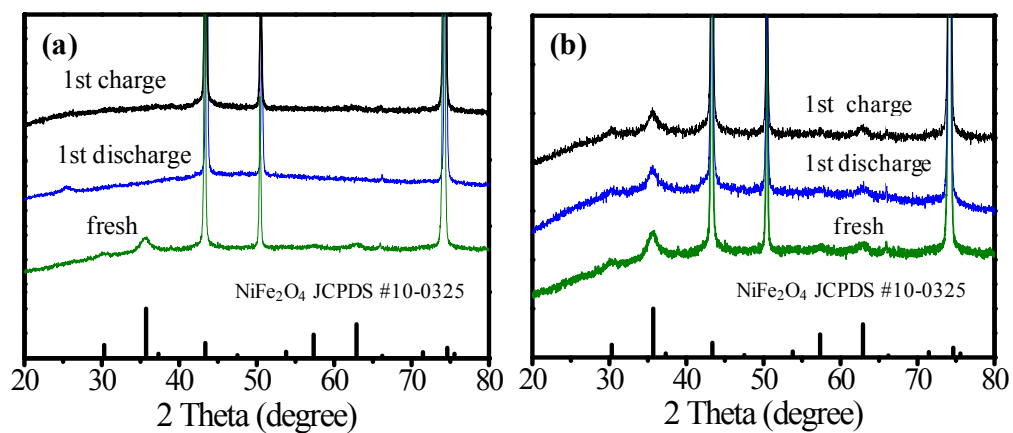


Fig. S6. Figure S5 XRD patterns of NFNTs electrodes at the different voltage states for (a) LIBs and (b) SIBs.

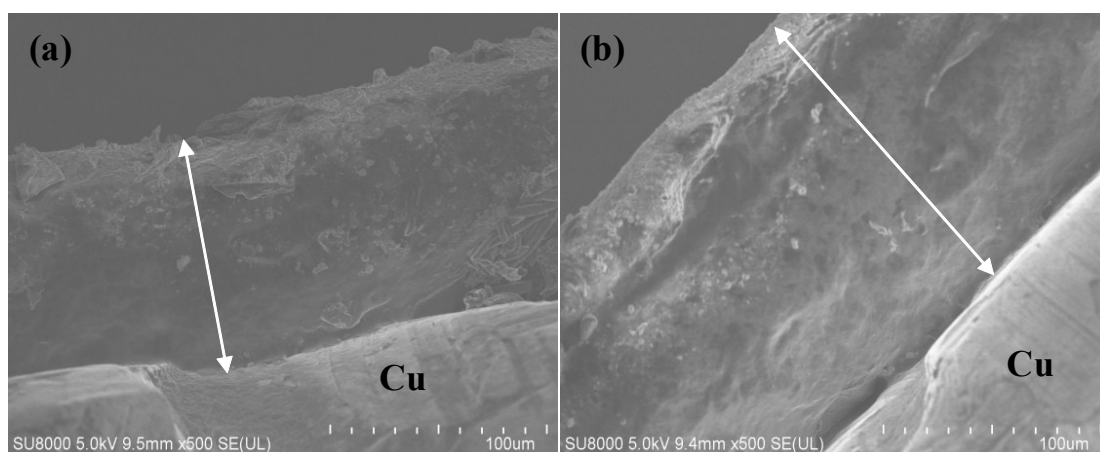


Fig. S7 Cross-section SEM images of NFNTs-GA (a) and NFNTs-PVDF (b) electrodes.

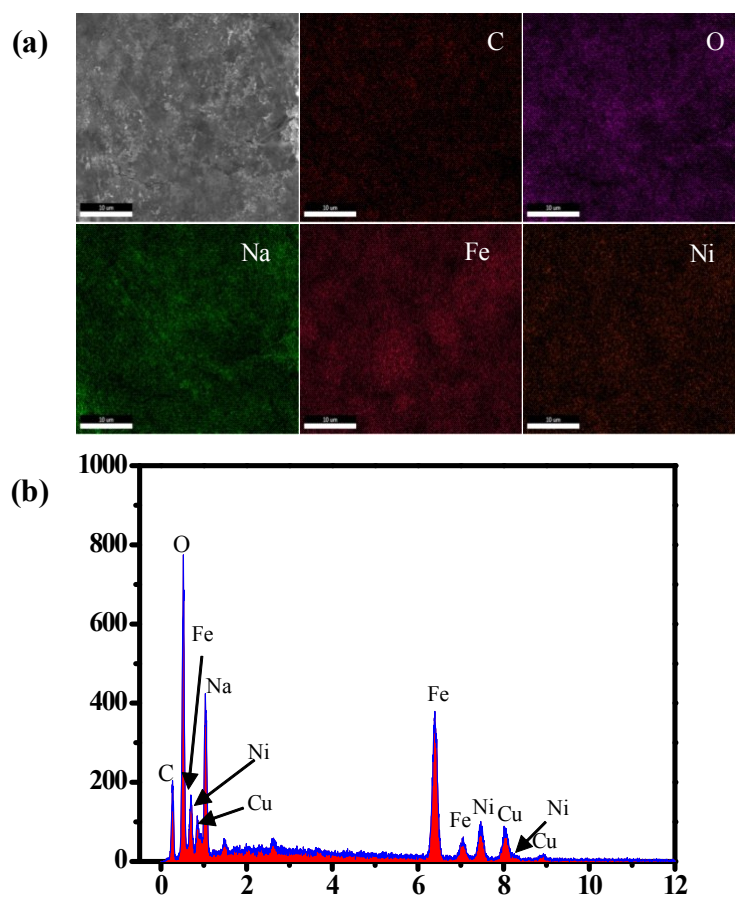


Fig. S8 The elements mapping (a) and the full area EDS (b) of NFNTs-GA electrodes after first discharge.

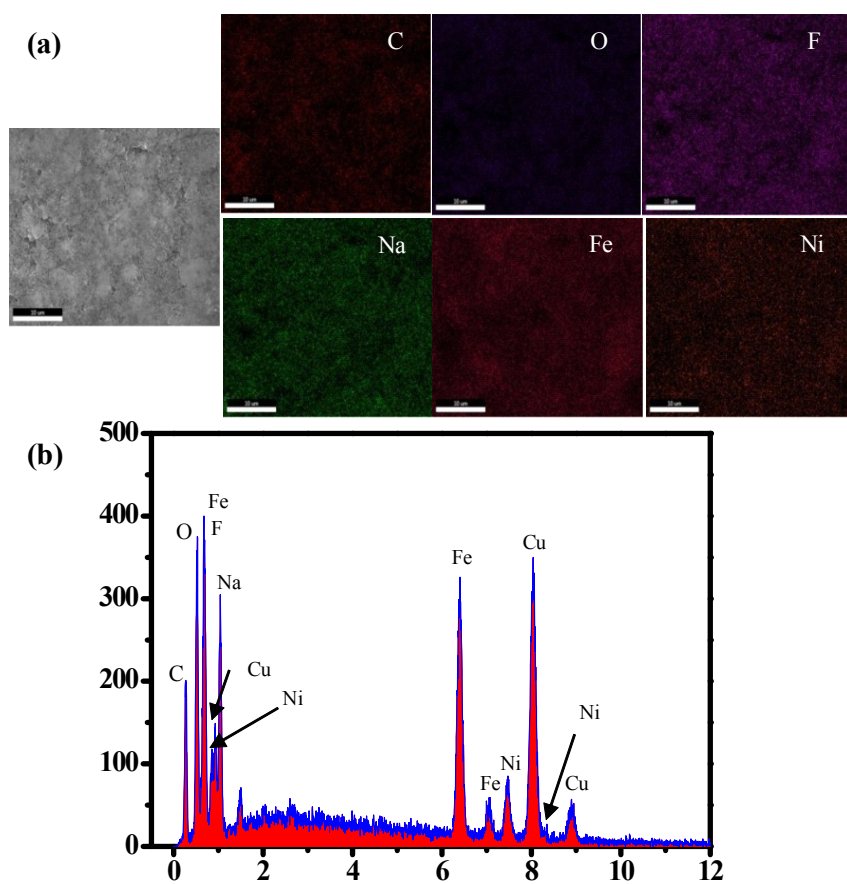


Fig. S9 The elements mapping (a) and the full area EDS (b) of NFNTs-PVDF electrodes after first discharge.

Table S1 The mass percent of the elements for NFNTs-GA and NFNTs-PVDF electrodes after first discharge.

Element	C	O	F	Na	Fe	Ni
PVDF(%)	23.9	17.9	12.4	15.8	22.5	7.5
GA(%)	20.4	28.5	-	19.5	23.8	7.8

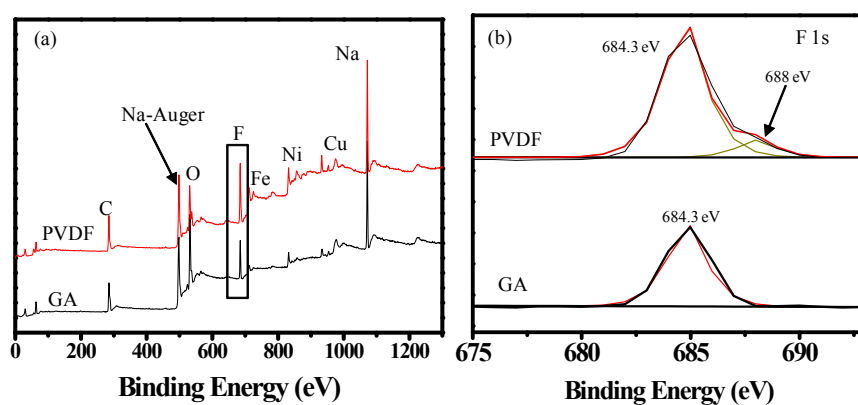


Fig. S10 (a) XPS survey and (b) F 1s of the different electrodes after first discharge.

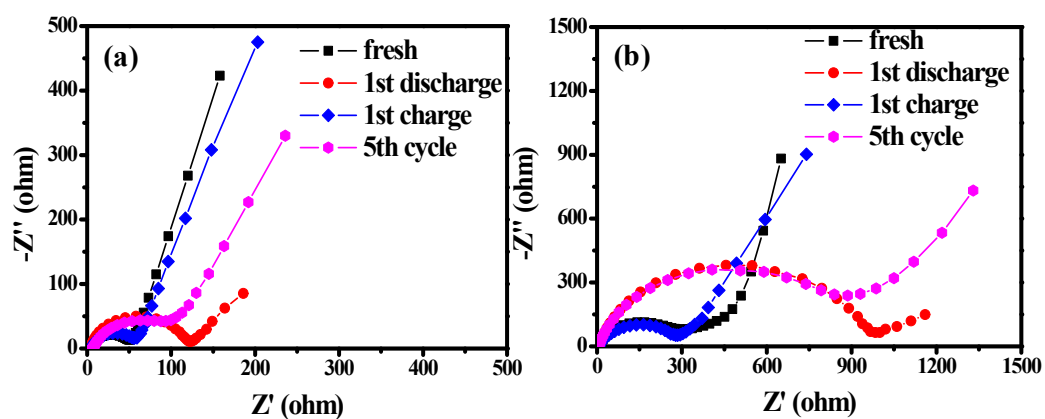


Fig. S11. Electrochemical impedance spectra (EIS): (a) NFNTs-GA and (b) NFNTs-PVDF electrode at different working states for SIBs.

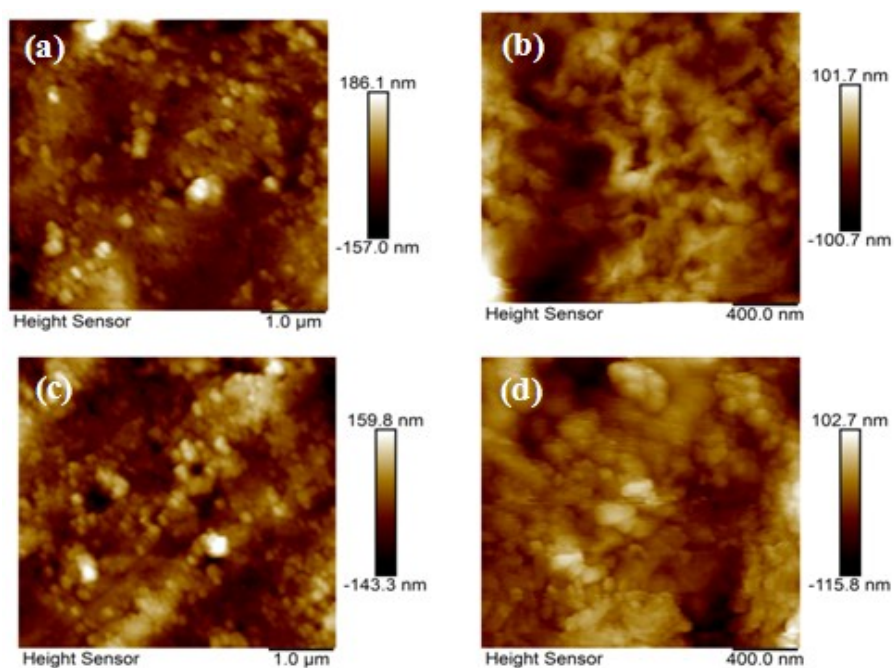


Fig. S12 Topography maps of NFNTs-GA (a, b) and NFNTs-PVDF (c, d) electrode for SIBs at different states: (a, c) fresh electrode, and (b, d) 5 cycles.