

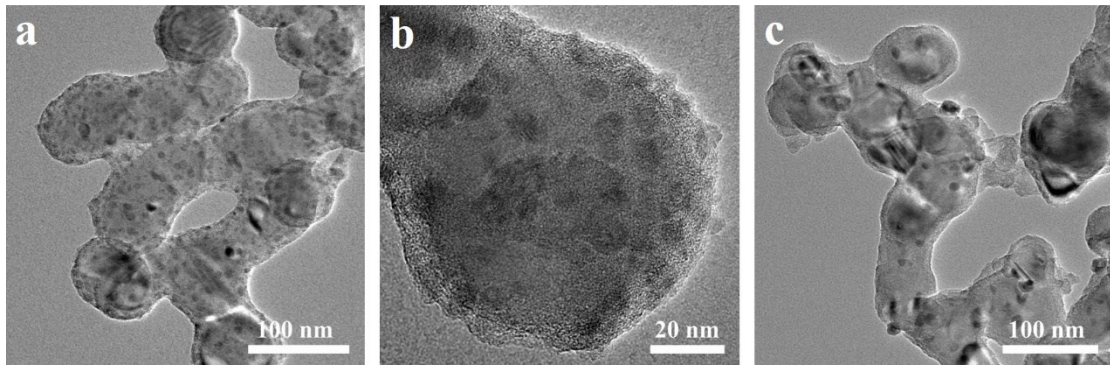
## Supporting information

### **Boosting initial coulombic efficiency in silicon anodes through interfacial incorporation of metal nanocrystals**

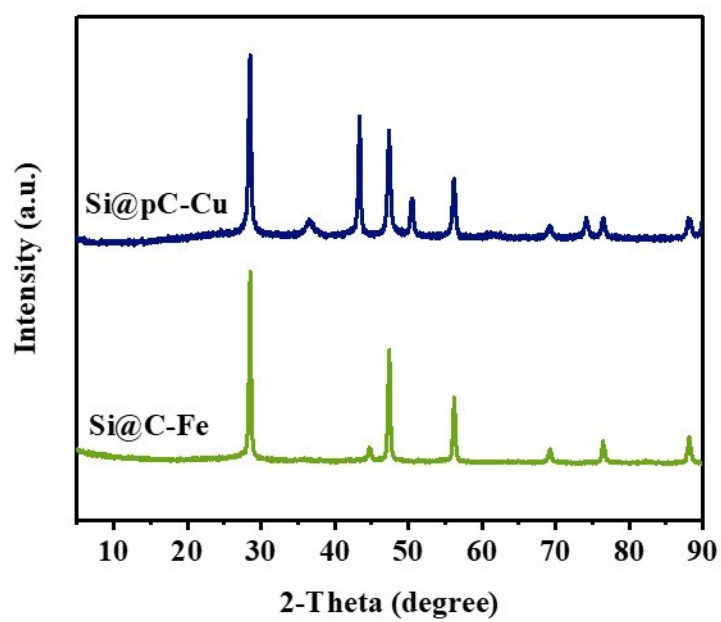
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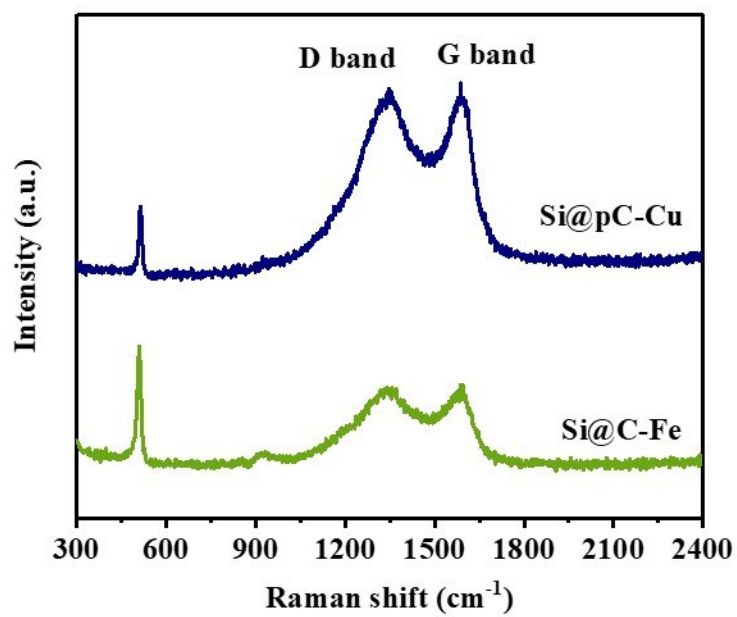
E-mail: [jianpingyang@dhu.edu.cn](mailto:jianpingyang@dhu.edu.cn)



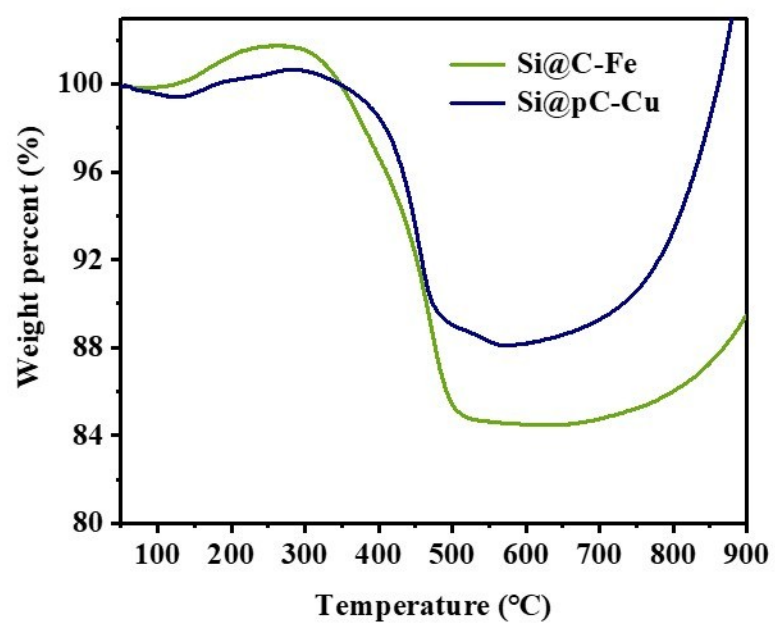
**Fig. S1** (a) TEM and (b) HRTEM image of Si@C-Fe, (c) TEM image of Si@pC-Cu.



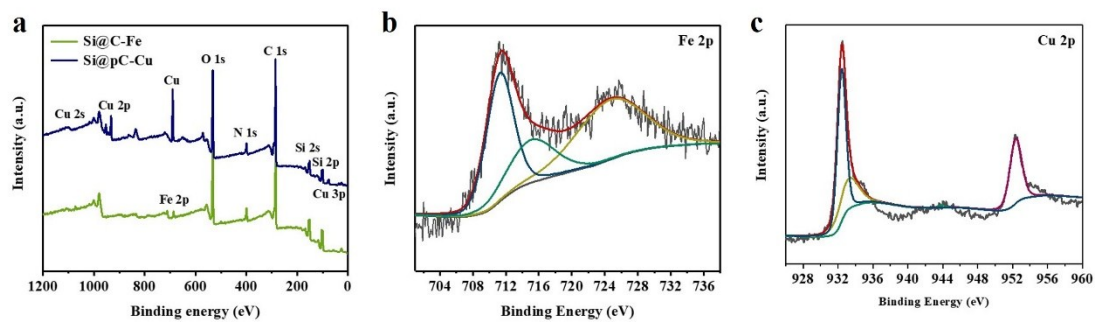
**Fig. S2** XRD pattern of Si@C-Fe and Si@pC-Cu.



**Fig. S3** Raman spectra of Si@C-Fe and Si@pC-Cu.



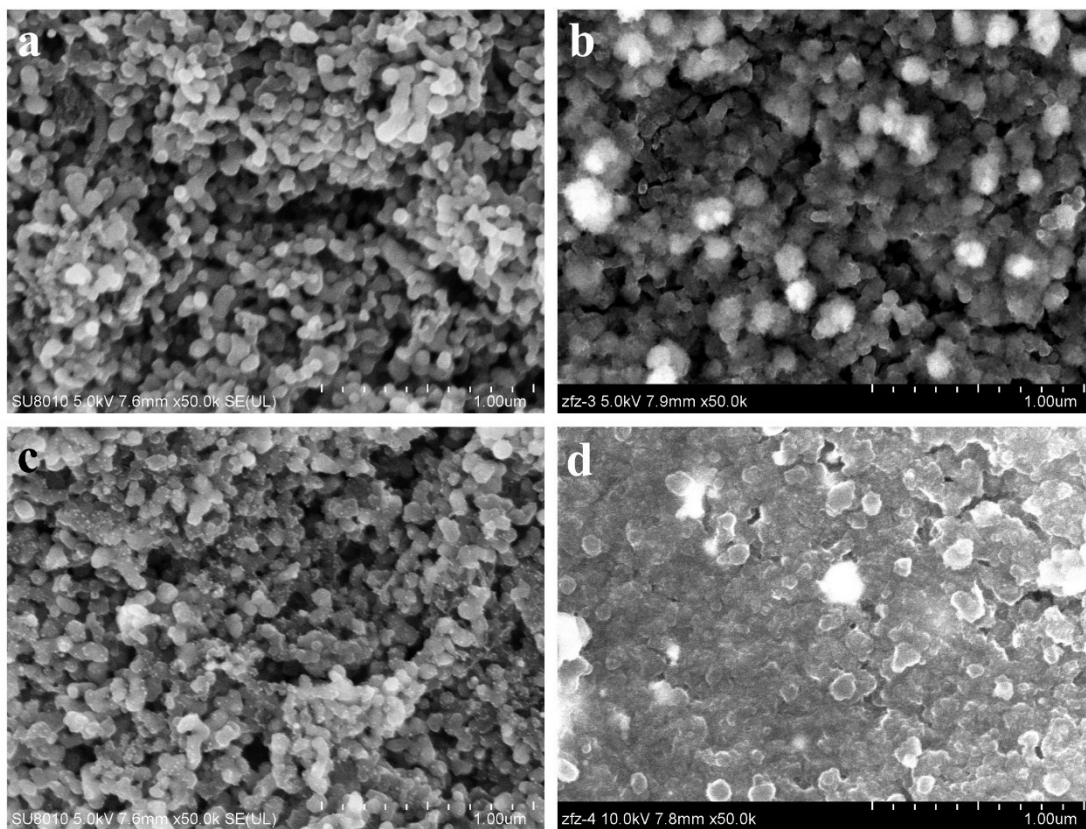
**Fig. S4** TGA curves of Si@C-Fe and Si@pC-Cu.



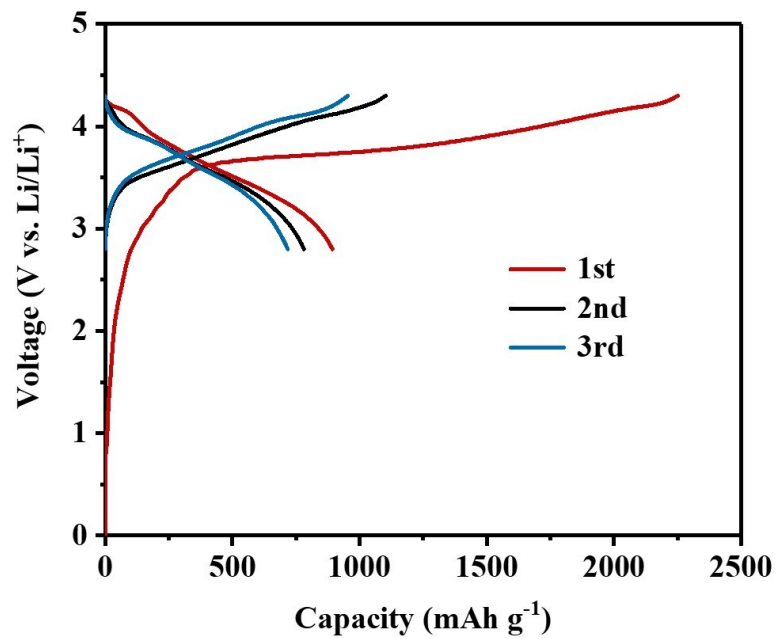
**Fig. S5** (a) XPS survey spectra of Si@C-Fe and Si@pC-Cu. (b) Fe 2p XPS spectra of Si@C-Fe and (c) Cu 2p XPS spectra of Si@pC-Cu.

sample	Proportion (%)			Initial charge capacity (mA h g <sup>-1</sup> )	Initial discharge capacity (mA h g <sup>-1</sup> )	ICE (%)
	Si	C	Metal			
Si@C-Fe	81	15.5	3.5	1761	2243	78.5
Si@pC	85.9	14.1	0	1902	2473	76.9
Si@pC-Ag	83.2	11.6	5.2	1886	2360	79.9
Si@pC-Cu	83.6	11.9	4.5	1697	2148	79

**Table S1.** Composition and initial electrochemical detail of Si@C-Fe, Si@pC, Si@pC-Ag, Si@pC-Cu electrode.

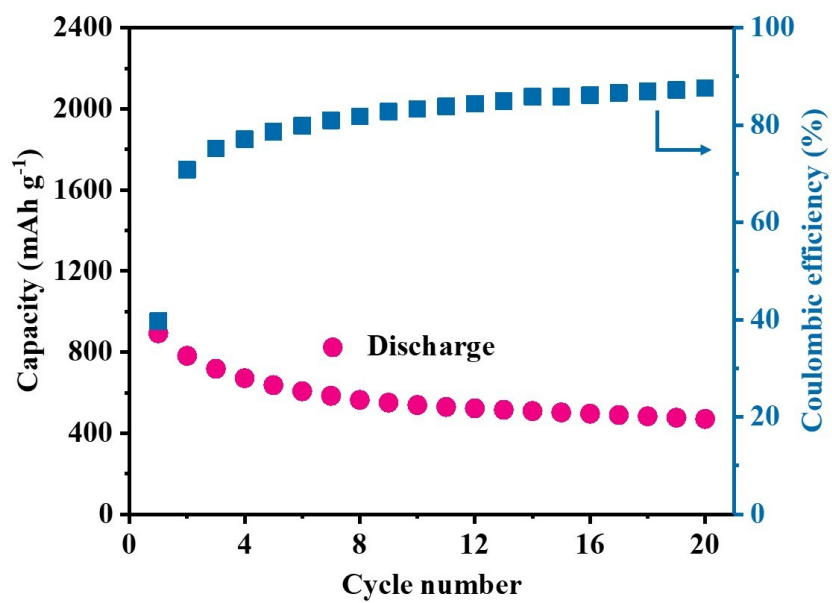


**Fig. S6** SEM images of Si@pC and Si@pC-Ag electrodes surface before (a, c) and after 50 cycles (b, d).



**Fig. S7** Charge/discharge curves of the full cell that paired the Si@pC-Ag anode with a commercial NCM811 cathode at a current density of 100 mA g<sup>-1</sup>.





**Fig. S8** Cyclic performance of the full cell at a current density of 100 mA g<sup>-1</sup>.