Supporing Information

ZIF-derived carbon-coated Co_9S_8 for silicon anode with superior performance in lithium-ion batteries

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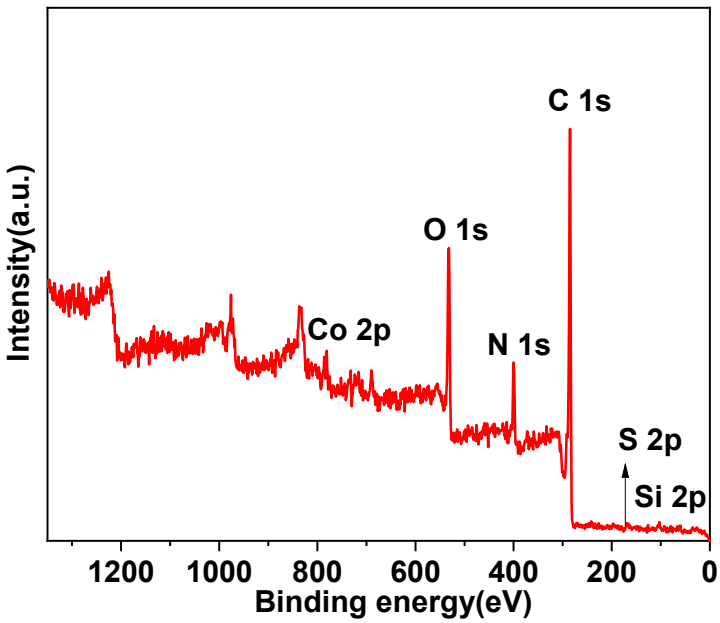

Fig. s1 XPS survey spectrum of Si@void@C@Co_9S_8@C

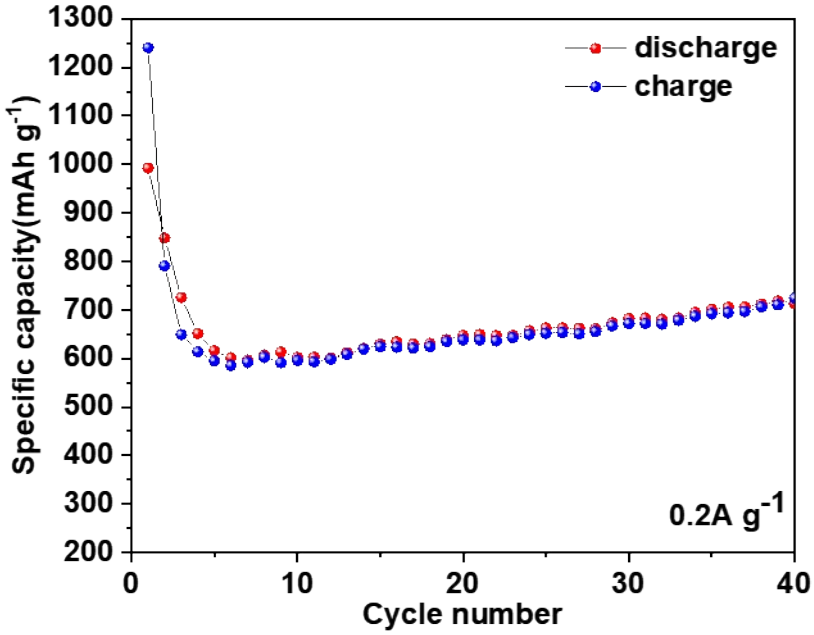

Fig. s2 cycling performance of Si@void@C@Co_9S_8@C at 0.2A g^{-1}

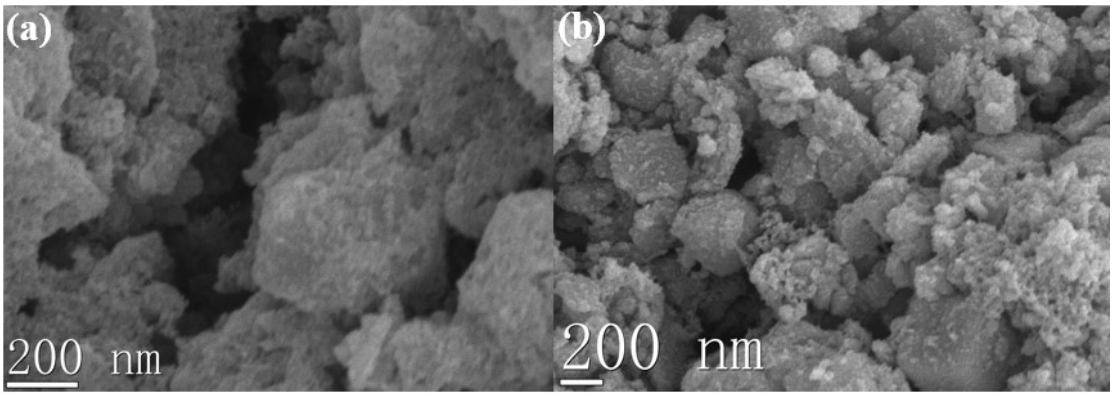

Fig. s3 a,b SEM images of Si@void@C@Co_9S_8@C after 400cycles at 1.0A g^{-1}

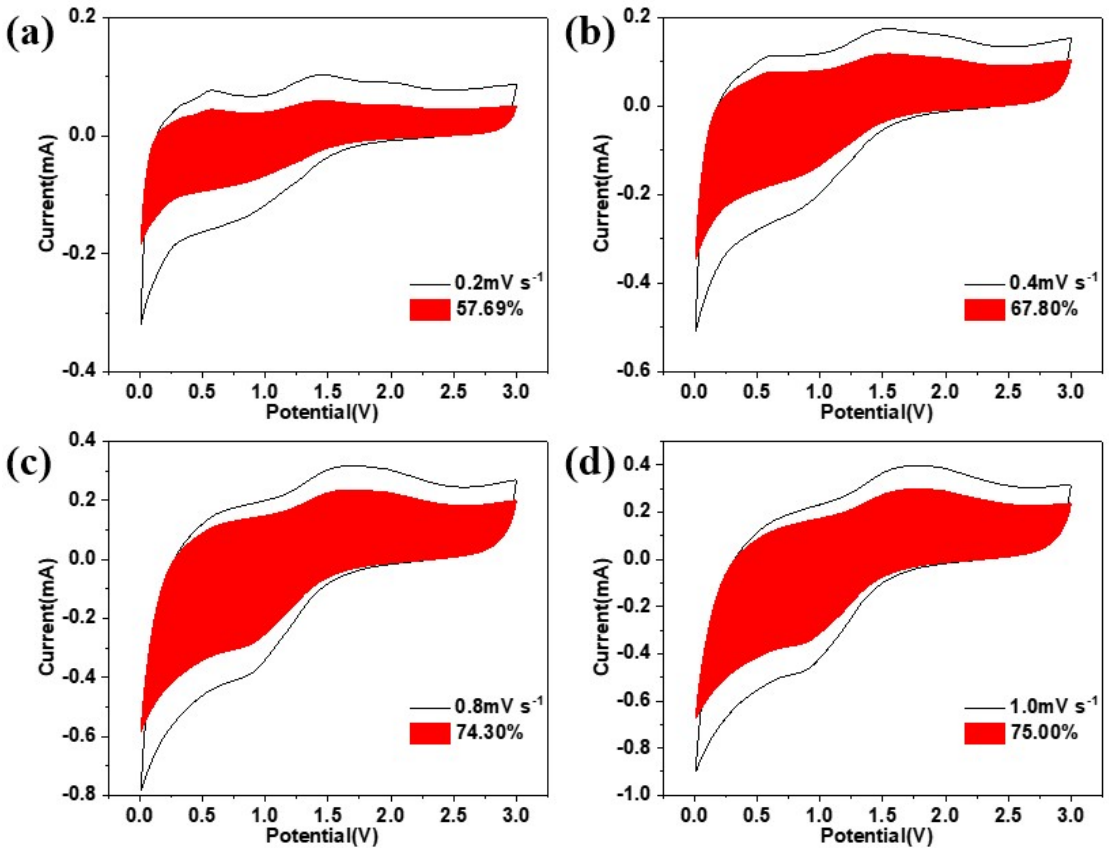

Fig. s4 the contribution of pseudocapacitance at the scan rate of **a** 0.2mV s^{-1}, **b** 0.4mV s^{-1}, **c** 0.8mV s^{-1}, **d** 1.0mV s^{-1}

Table s1 Comparison of performance of other Si-C and Co_9S_8 materials for lithium-ion batteries

Anode	Current Density(A g^{-1})	Discharge Capacity(mAh g^{-1})	Cycle Number	Ref.
Si@void@C@Co_9S_8@C	1.0	658.1	500	this work
Si@void@C@Co_9S_8@C	0.2	713.1	40	this work
yolk-shell Si@void@C	0.05	628	100	[8]
porous Si-C	0.2	530	100	[9]
hollow core-shell Si@C	0.1	767	100	[11]
Co_9S_8/C	1.0	680	700	[12]
Co_9S_8@C	0.5	406.5	100	[13]
H-Co_9S_8+MWCNTs	0.3	511.3	50	[14]
CoSx/CP	0.5	562	300	[15]
Si@C@void@C	0.2	710	100	[25]
Co_9S_8/C-T	0.2	709	150	[54]

Table s2 Kinetic parameters of Si@void@C@Co_9S_8@C and Si@void@C

Sample		Rs(Ω)	Rct(Ω)	Wo(Ω)
Si@void@C@Co_9S_8@C	before	8.30	127.6	75.3
	after		147.9	619.5
Si@void@C	before		142	84.63
	after		179.8	420.6

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