Supplementary Information (SI) for Dalton Transactions.

Chemically bonded Bi@C in porous carbon bundles for ultrafast and stable sodium storage

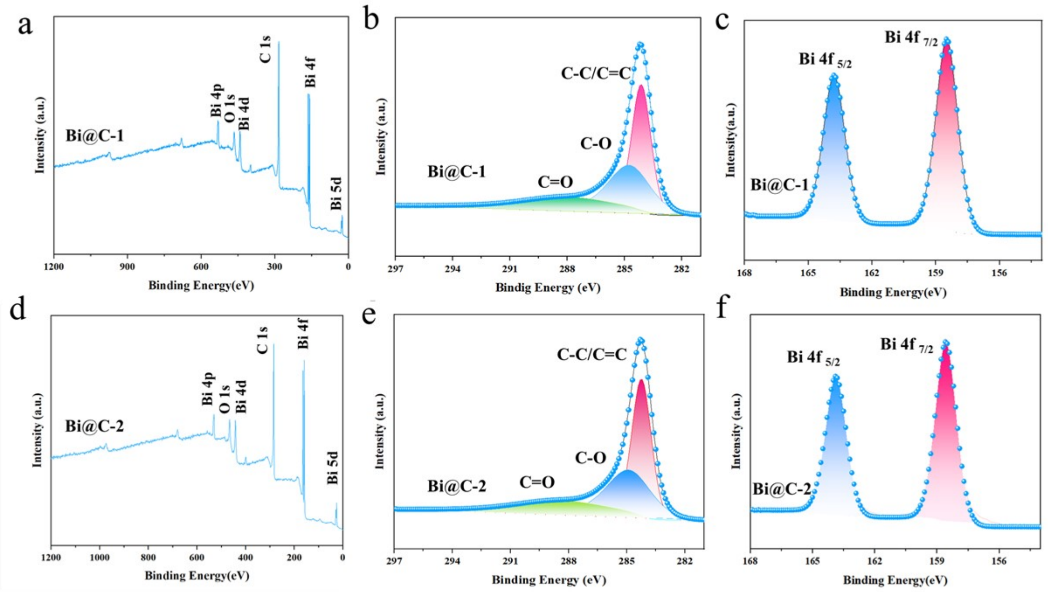

Fig.S1 XPS survey for (a) Bi@C-1 and (d) Bi@C-2; C1s and Bi 4f for (b,c) Bi@C-1 and (e, f) Bi@C-2

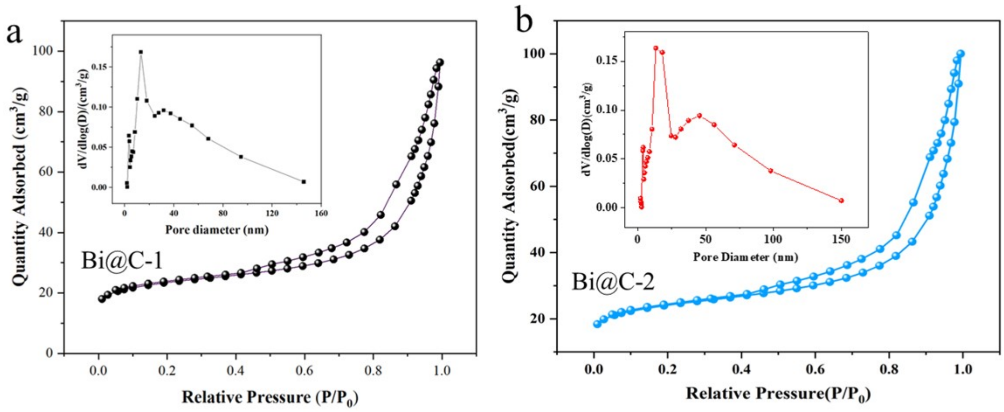

Fig.S2 Nitrogen adsorption-desorption isotherms of Bi@C-1 and Bi@C-2 (inset: Pore size distribution calculated from adsorption isotherms).

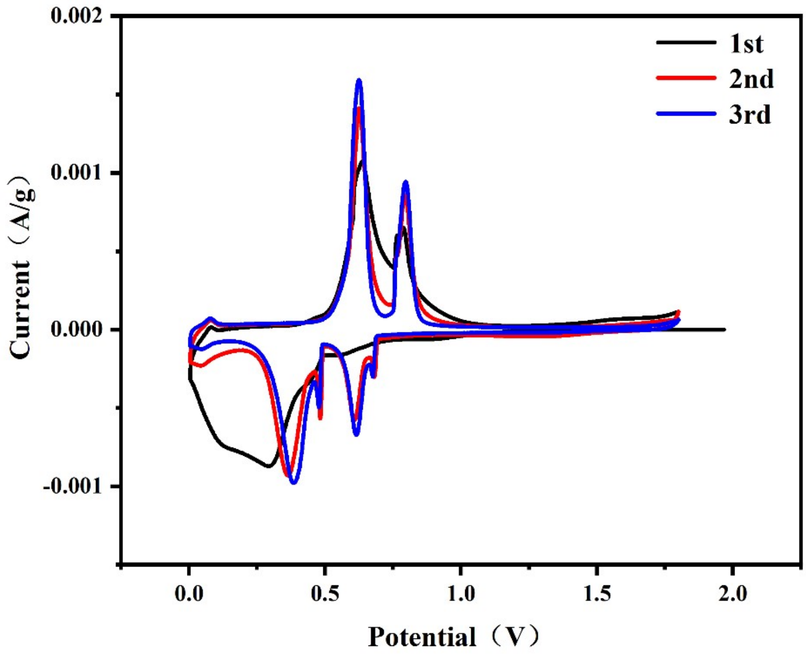

Fig.S3 CV curves for Bi@C-1 at 0.2 mV/s

Table S1 Comparison of Bi-based anodes reported in literature for SIBs.

Materials	Carbon content	Rate capability	Cycling performance (Capacity retention)	Refs
Bi/Carbon fibers	49.7%	376.5, 356.8, 343.6, 329.2, 318.1, 302.3 and 283.9 mAh/g at the current densities of 0.1,0.2, 0.5, 1.0, 2.0, 5.0 and 10.0 A/g	316 mAh/g at 1.0A/g after 2000 cycles (93%)	[1]
Bi@C	35.9%	315, 295, 288, 282, 279, 275 mAh/g at 0.4, 0.8, 2, 4, 8, 20 A/g	302 mAh/g at 0.8 A/g after 3000 cycles (92%)	[2]
Bi@N doped Carbon	38%	300, 282, 262, 252, 240 mAh/g at 1, 2, 5, 10, 20 A/g	300 mAh/g at 1A/g after 400 cycles (86%)	[3]
Bi@ N-Doped Porous Carbon Frameworks	24.7%	282, 275, 265, 258, 252, 250, 248 at 0.2, 0.6, 1, 2, 5, 10, 20 A/g	250 mAh/g at 10 A/g after 2000 cycles (81%)	[4]

Bi@ mesoporous carbon	27.3%	321, 292, 280, 285, 291, 285, 280, 275 mAh/g at 0.05, 0.1, 0.2, 0.5, 1, 2, 5, 10 A/g	300 mAh/g at 1A/g after 350 cycles (94%)	[5]
Bi@N-Doped carbon	22.1%	392.9, 376.7, 363.9, 359.5, 347.5 and 344.1, 338 mAh/g at 0.1, 0.2, 0.5, 1.0, 2.0, and 5.0, 10 A/g	402 mAh/g at 0.2 A/g after 400 cycles (98%)	[6]
$BiSb_x$@ carbon fibers	---	303.9, 236.1, 213.9 and 178.0 mAh/g at 0.05, 5, 10, and 20 A/g	500.2 mA h/g at 0.05A/g after 100 cycles (86.4%)	[7]
Bi@ Porous Hard Carbon Frameworks	21.2%	301, 310, 315, 320, 320, 322 mAh/g at 0.2, 0.5, 1, 2, 5, 10 A/g	325 mA h/g at 1A/g after 1000 cycles (89.4%)	[8]
Bi@C in Porous Carbon Bundles	**26.2%**	**381.2, 362.5, 359.8, 356.7, 350.1, 347.6, 342.2 mAh/g at 0.2, 0.5, 1, 2, 5, 10 and 15 A/g**	**320.2 mA h/g at 2A/g after 1000 cycles (82.5%)**	**This work**

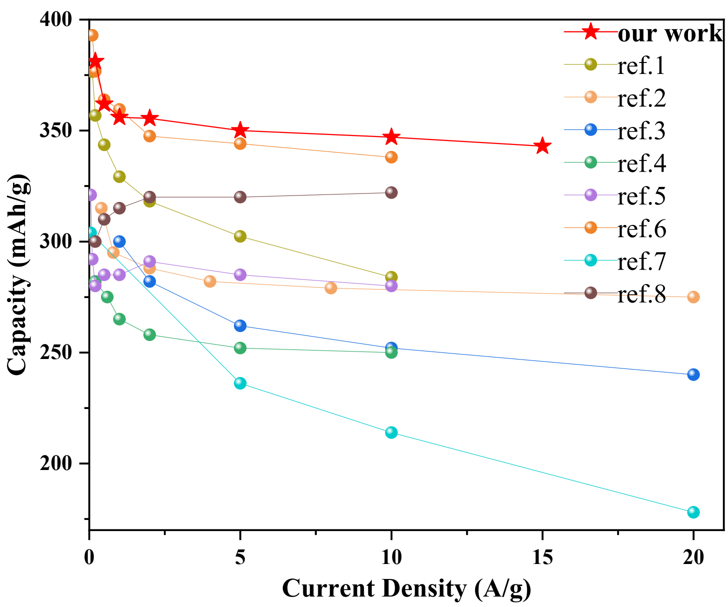

Fig.S4 Rate capability comparison of Bi-based anodes reported in literature for SIBs.

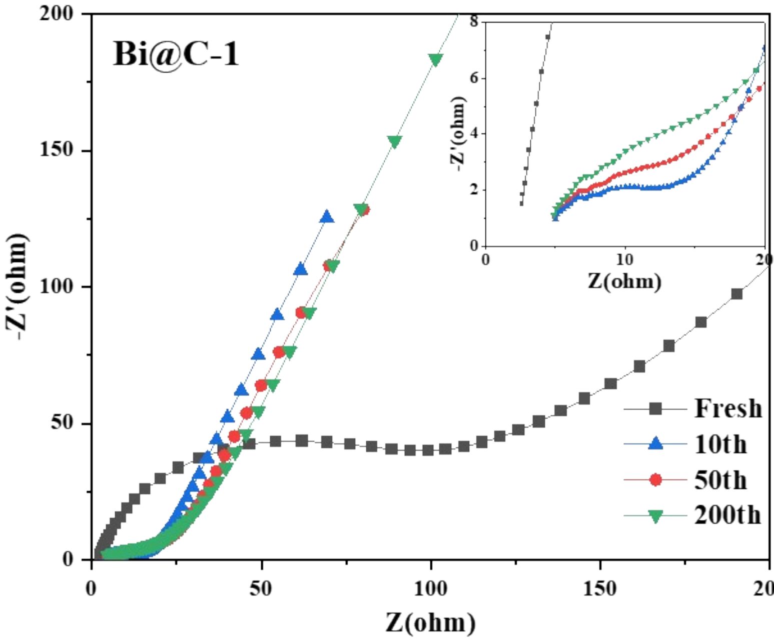

Fig.S5 Nyquist plots of the fresh and cycled Bi@C-1 electrodes

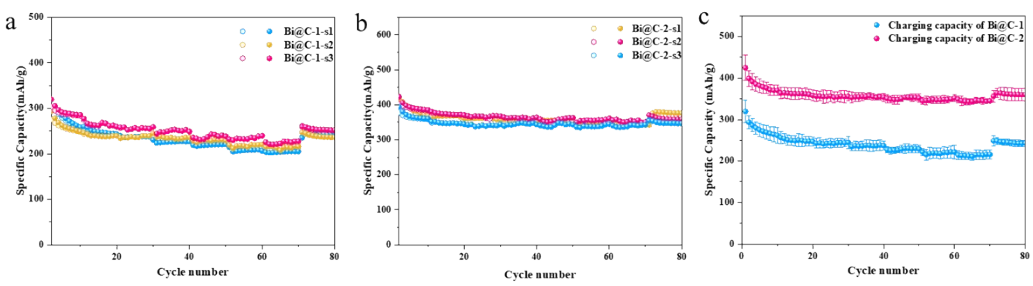

Fig.S6 Rate performance of three parallel samples of (a)Bi@C-1; (b) Bi@C-2; and (c)Rate performance of two samples with error bars

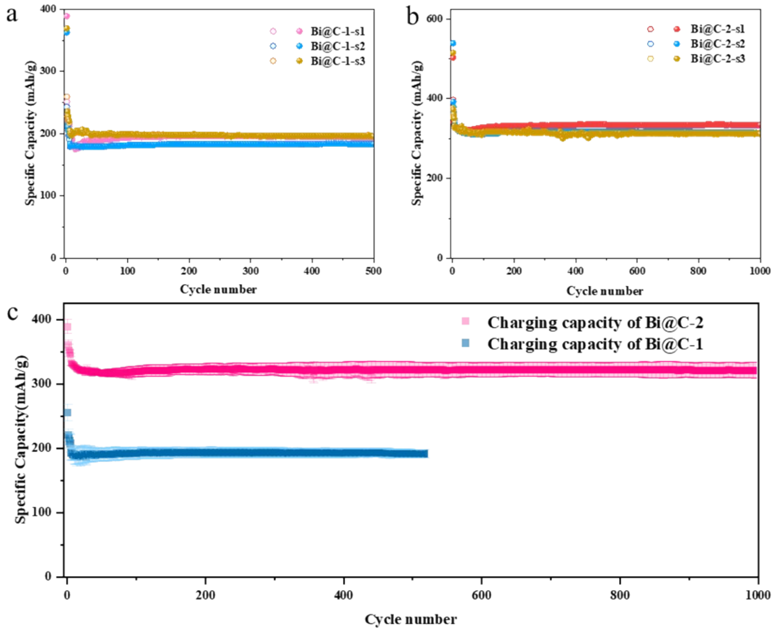

Fig.S7 Cycling performance of three parallel samples of (a)Bi@C-1; (b) Bi@C-2; and (c)Long Cycling performance of two samples with error bars

Reference

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