Supporting Information

Dynamic Template Directed Construction of Three-Dimensional Porous Bismuth Aerogel for High-Rate Na-Ion Storage

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Table and Figure

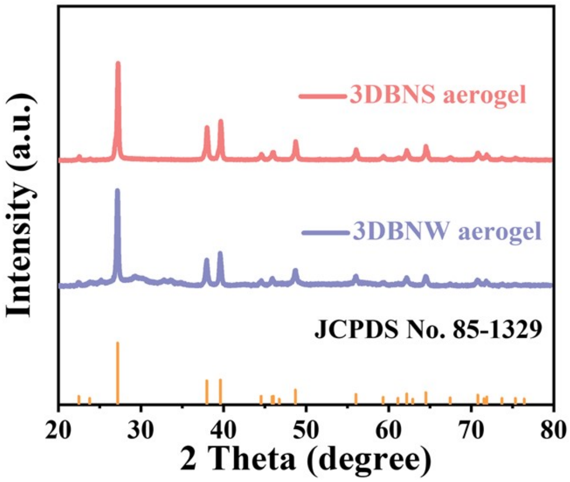

Figure S1 XRD patterns of 3DBNS, 3DBNW aerogels and Bi standard.

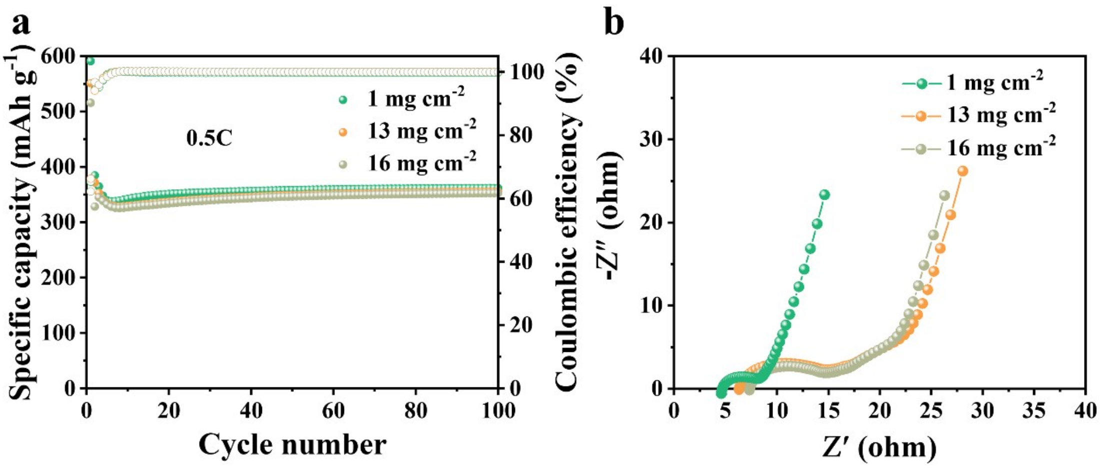

Figure S2 (a) The specific capacity at 0.5C and (b) Nyquist plots of 3DBS aerogels with different mass loadings of ~1, ~13 and ~16 mg cm^{-2}.

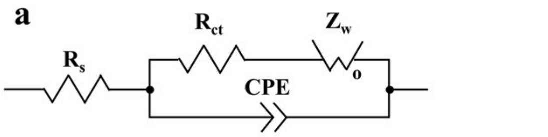

Figure S3 Equivalent circuit models for 3DBS aerogels with different mass loadings of (a) 1 and (b) ~13/16 mg cm^{-2}.

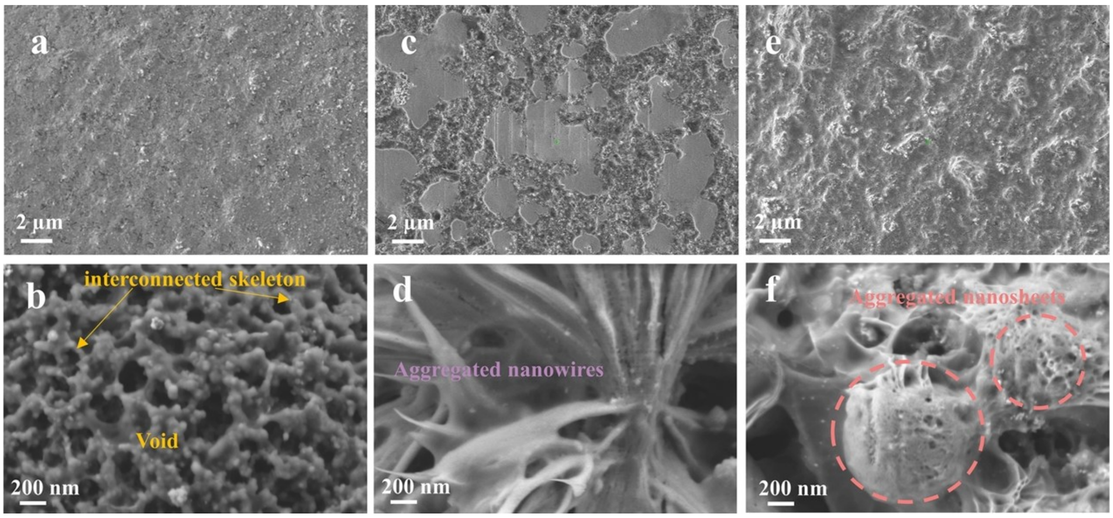

Figure S4 SEM images of (a, b) 3DBS, (c, d) 3DBNW and (e, f) 3DBNS aerogels.

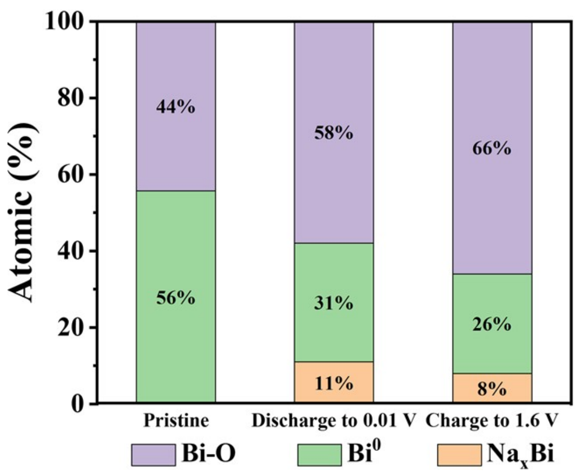

Figure S5 Contents of Bi^0, Bi-O and Na_xBi at pristine state, after being discharged to 0.01 V and after being charged to 1.6 V.

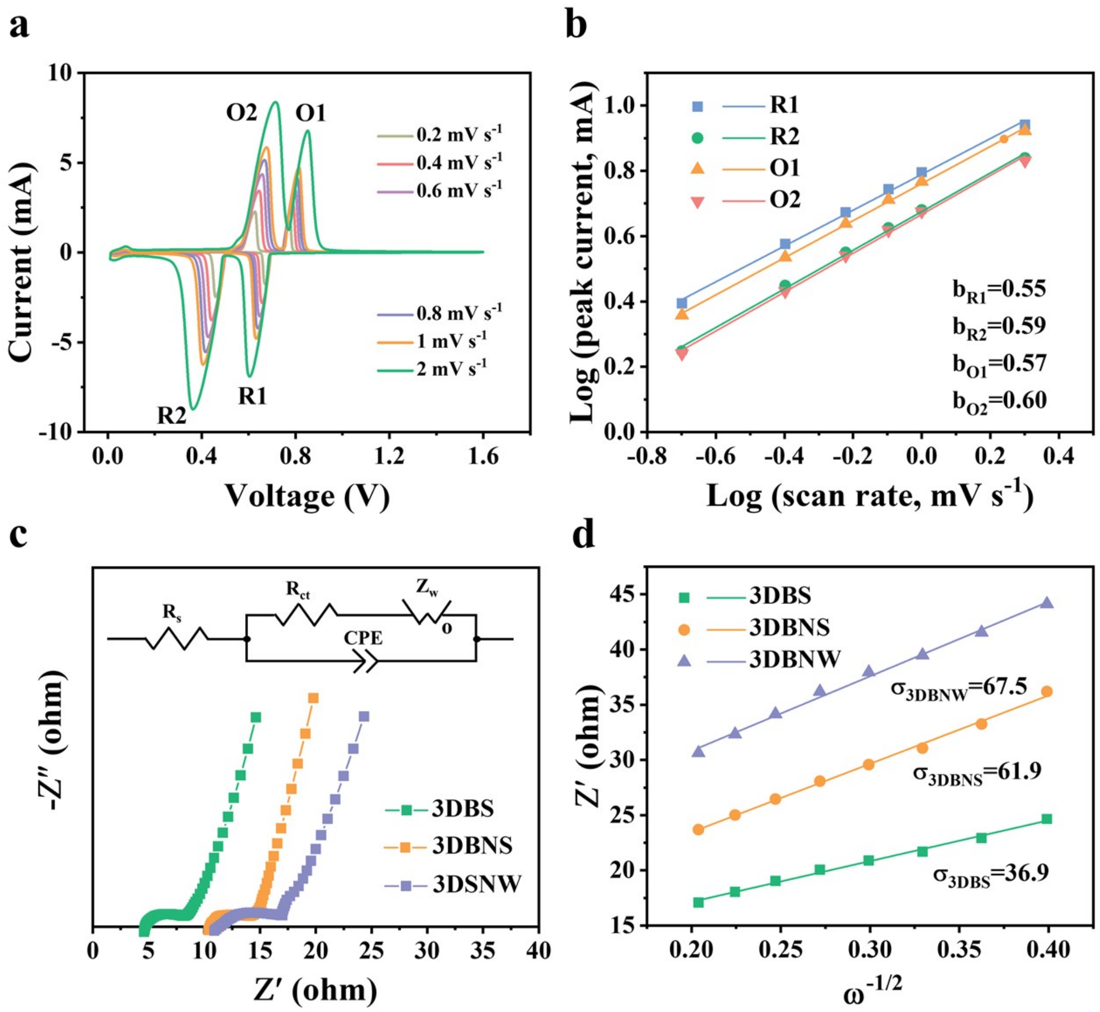

Figure S6 (a) CV curves of the half-cells based on 3DBS; (b) The log(*i*) vs. log(*v*) curve of the cathodic/anodic peaks; (c) Nyquist plots of 3DBS, 3DBNS and 3DBNW aerogels with a mass loading of 1 mg cm^{-2}.

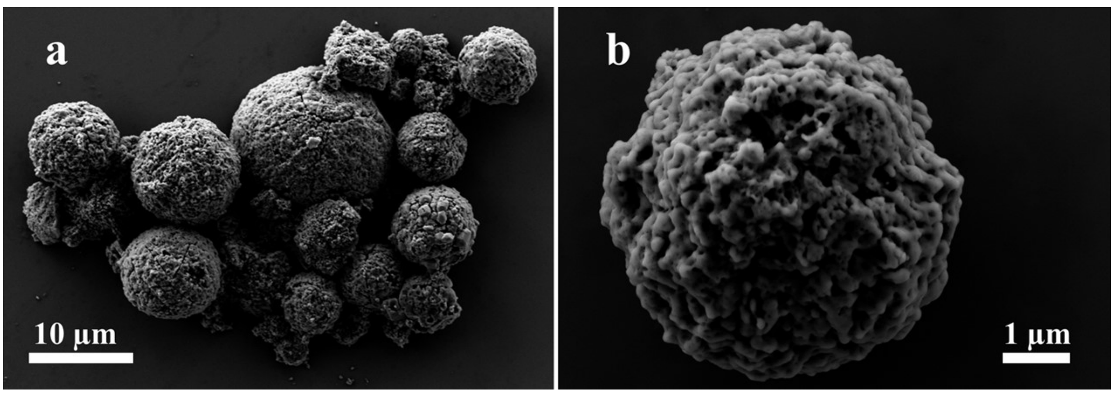

Figure S7 (a and b) Large scale and high-resolution SEM images of $Na_3V_2(PO4)_3$.

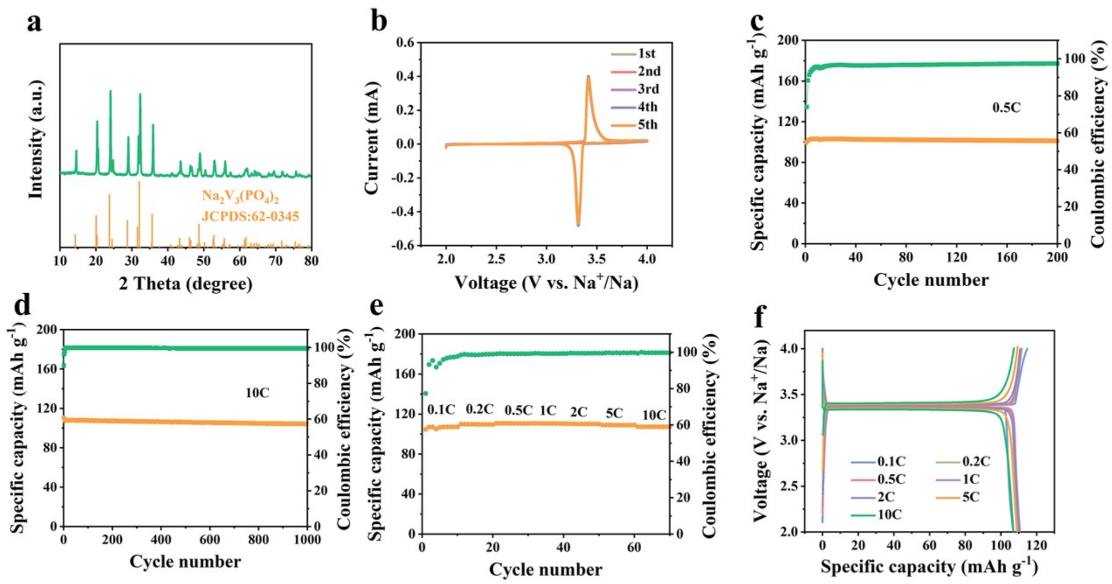

Figure S8 (a) XRD pattern; (b) CV curves over 2-4.0 V at 0.1 mV s^{-1}; (c) Cycling stability at 0.5C; (d) Long-term cycling stability at 10C; (e) Rate performance and (f) Galvanostatic charge/discharge curves of $Na_3V_2(PO4)_3$ cathode.

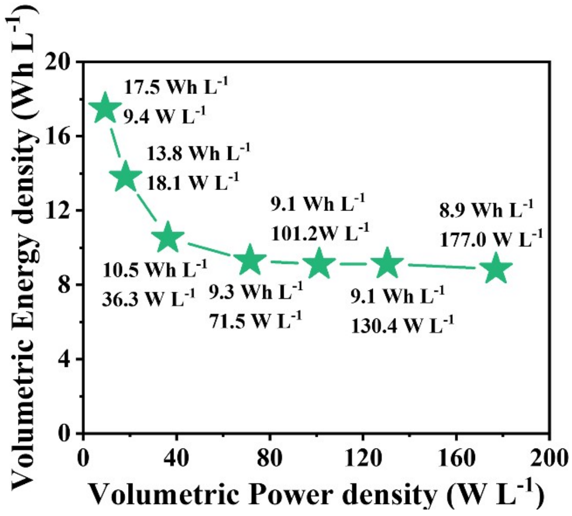

Figure S9 Volumetric energy density vs. power density curve.

Table S1 Comparison on specific surface areas and pore volumes of 3DBS, 3DBNW and 3DBNS aerogels.

Aerogel	**3DBS**	**3DBNW**	**3DBNS**
Specific surface area (m^2 g^{-1})	16.64	6.49	12.27
Pore volume (cm^3 g^{-1})	0.075	0.045	0.069

Table S2 Half cell performance of Bi-based anodes for Na-ion batteries

Materials	**ICE**[a]	**Cycling performance**[b]	**Rate capacity**[c]	**Electrolyte**	**Ref**
Bi@C⊂CFs	52.4%/1	305(89.4%)/5000th/5	309/80	1M $NaPF_6$/ EC/DEC	20
Bi@C	-	280(95%)/200th/0.8	-	1M $NaPF_6$/DME	28
Bi@NC	63%/1	-/2000th/1	220/3	1M $NaPF_6$/DME	42
Bi@C	45%/0.1	123.5(-)/100th/0.1	83.4/2	1M $NaClO_4$/ EC/PC	44
Bi@3DGFs	36%/0.1	208(86.3%)/95th/0.1	180/50	1M $NaPF_6$/DME	47
FLB-G	-	317(-)/1000/0.7	263/1	1M $NaPF_6$/ Diglyme	48
3DBNW	61%/0.5	194(58.9%)/300th/0.5	250/30	1M $NaPF_6$/ Diglyme	This work
3DBNS	63%/0.5	305(84.96)/300th/0.5	289/30	1M $NaPF_6$/ Diglyme	This work
3DNS	65%/0.5	358(93.2%)/300th/0.5	331/30	1M $NaPF_6$/ Diglyme	This work

[a)] The ICE is summarized as ICE/current density (A g^{-1}) or (C) used in this work

[b)] The cycling performance is summarized as capacity (mAh g^{-1})(capacity retention)/cycle number/current density (A g^{-1}) or (C) used in this work

[c)] The rate capability is summarized as capacity (mAh g^{-1})/current density (A g^{-1}) or (C) used in this work

[d)] The common mass loading used in these literatures references is ~1 mg cm^{-2}, except for few high loadings of ~2 mg cm^{-2} in *Ref. 48* and ~12 mg cm^{-2} in *Ref. 28*

Table S3 Full cell performance with Bi-based anodes for Na-ion batteries

Full cell cathode//anode	Cycling performance[a]	Rate capacity[b]	Energy density (Wh kg^{-1})	Mass ratio (cathode: anode)	Ref
NVP//Bi@NS-C	283/140/1	196/10	220	1:3	15
NVP//Bi@C	242/500/1	131/10	144	4:1	28
NVP//Bi@NC	223/200/1	180/5	125	3.5:1	57
NVP/C//Bi@N-C	240/800/1	223/2	119	1.4:1	58
NVP//3DBS	187/1000/5	198/15	236	4:1	This work

a) The cycling performance is summarized as capacity (mAh g^{-1})/cycle number/current density (A g^{-1}) or (C) used in this work

b) The rate capability is summarized as capacity (mAh g^{-1})/current density (A g^{-1}) or (C) used in this work

c) The electrolyte used in *Ref. 28* and *57* is 1 M $NaPF_6$ in DME and the electrolyte used in *Ref. 15*, *Ref. 58* and this work is 1 M $NaPF_6$ in diglyme