Supporting information

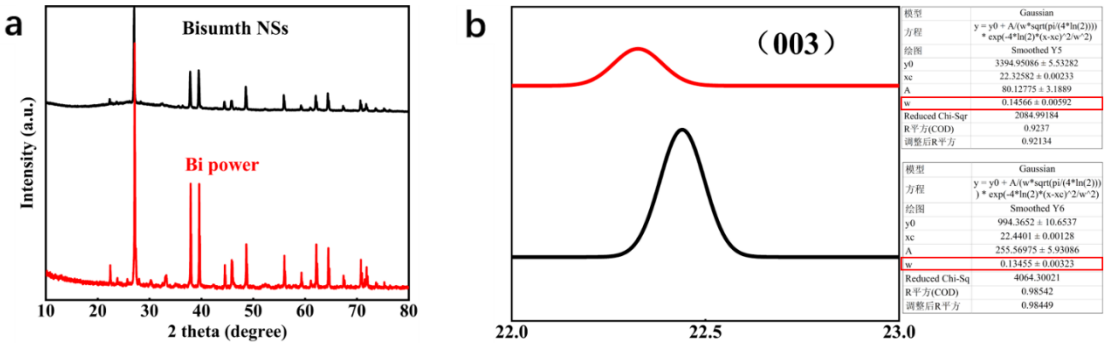

Fig. S1. (a) XRD pattern of the Bismuth NSs and commercial Bi powder, and (b) Enlargement of (a).

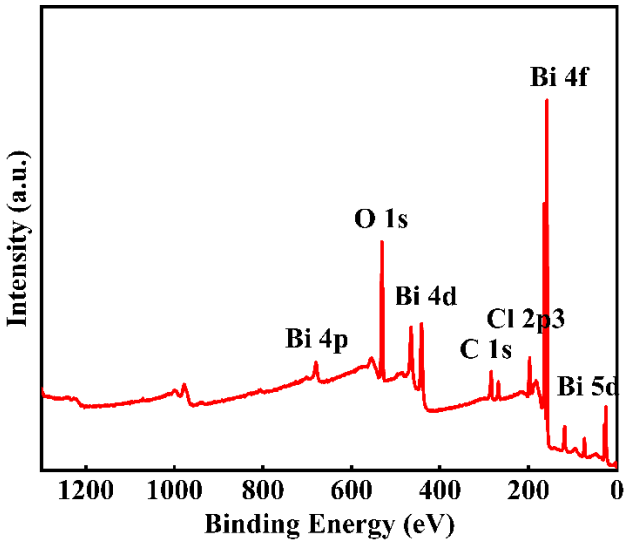

Fig.S2. XPS spectra of Full survey.

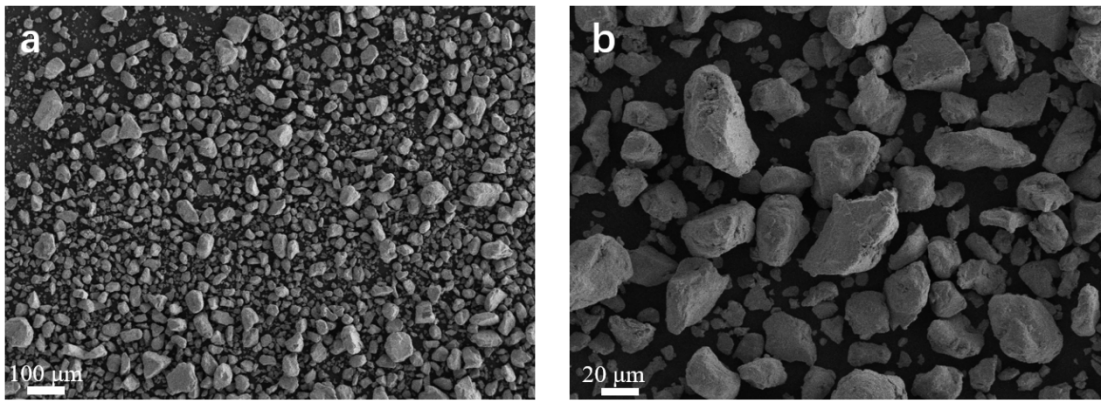

Fig.S3. SEM images of commercial bi powder

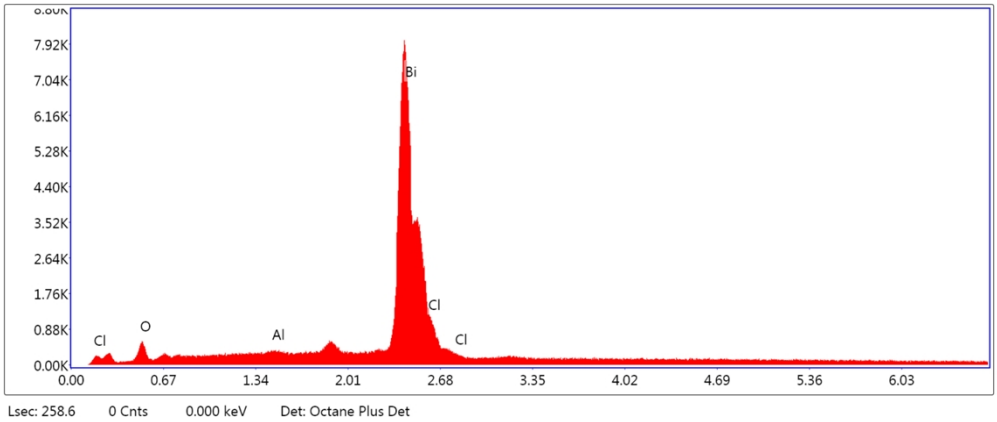

Fig.S4. Elemental mappings of Bismuth NSs.

Table S1. The Elemental content of Bismuth NSs

Element	Weight %	Atomic %	Net Int.	Kratio	Z	R	A	F
O K	2.35	20.03	19.20	0.0128	1.8075	0.7032	0.3025	1.0000
AlK	0.00	0.00	0.00	0.0000	1.5965	0.7541	0.6901	1.0013
BiM	92.60	60.50	522.70	0.9203	0.9554	1.0332	1.0146	1.0254
ClK	5.05	19.47	50.50	0.0584	1.5310	0.7969	0.7534	1.0009

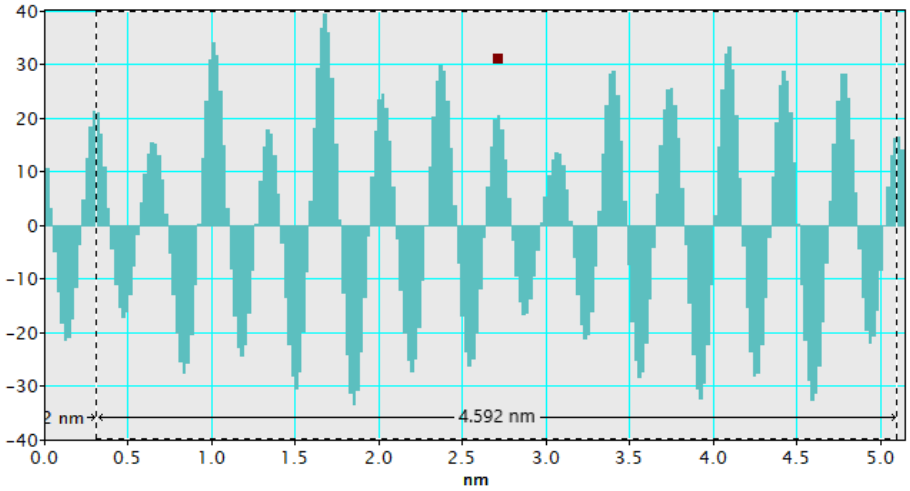

Fig.S5 Lattice profiles of the (012).

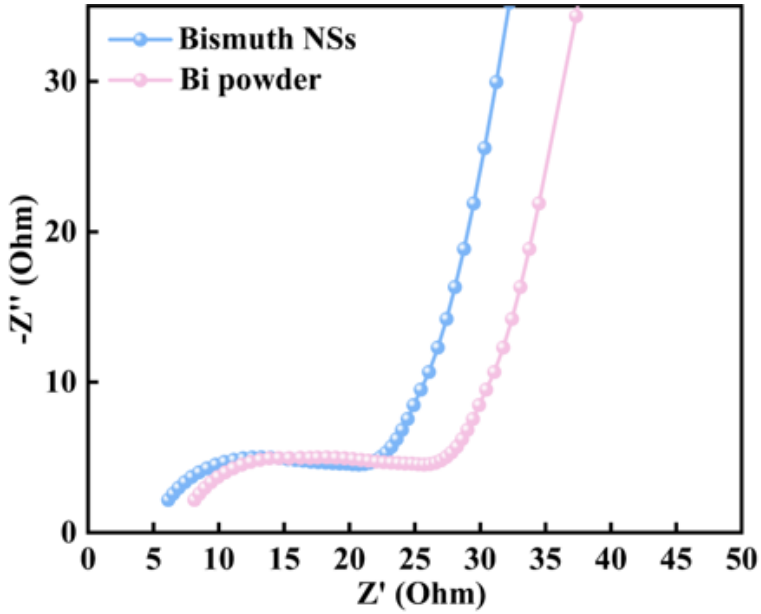

Fig.S6 The electrochemical impedance spectra of Bismuth NSs and commercial bi powder electrodes at initial cycle.

Table S2. Charge transfer resistance (Rct) of different cycles after fitting.

Different cycles	Rct (Ω)
1	38.36
100	2.96
1000	1.78

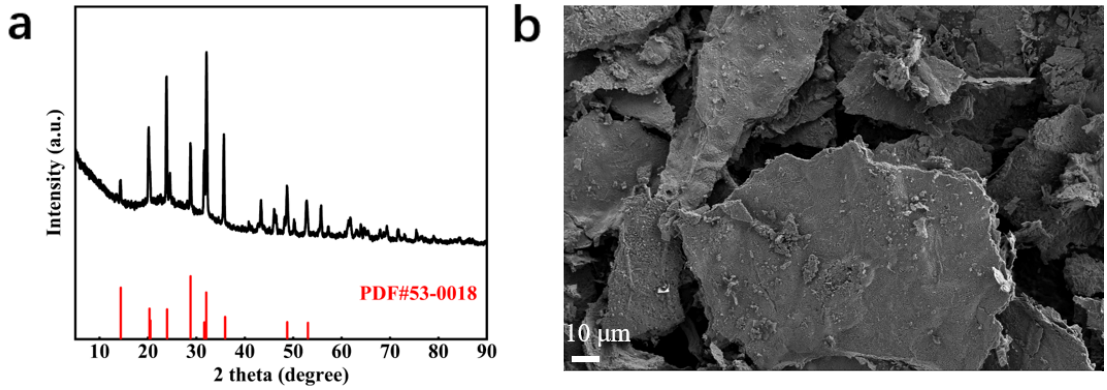

Fig.S7 . (a) XRD pattern (b) SEM images of NVP@rGO.

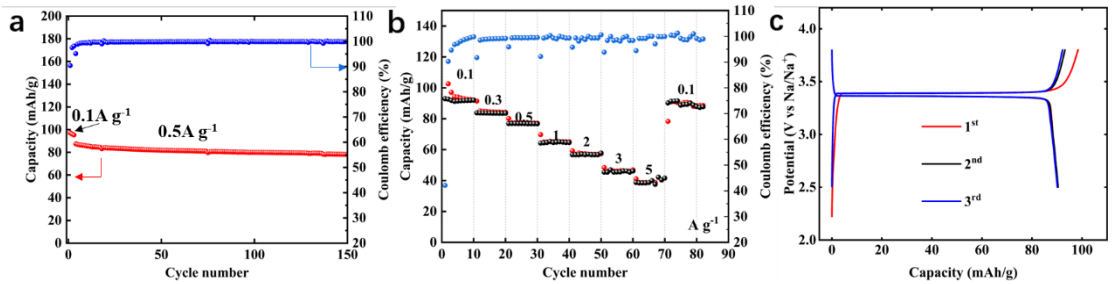

Fig.S8. Electrochemical performance of the NVP@RGO (a) cycling performance with the corresponding Coulombic efficiency at 0.5 A g^{-1} (b) rate performance (c) galvanostatic charge/discharge curves at 0.1 A g^{-1}.

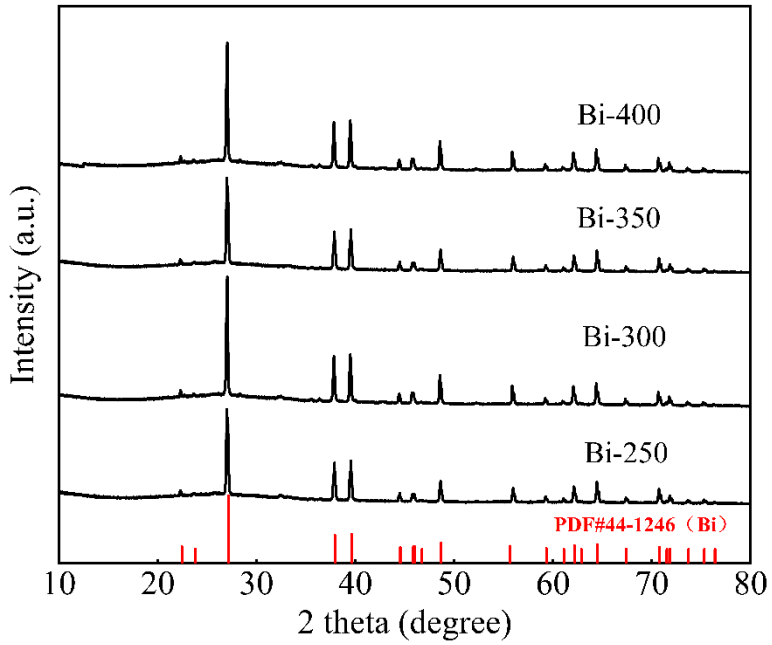

Fig.S9. XRD pattern of Bismuth NSs prepared at different temperatures.

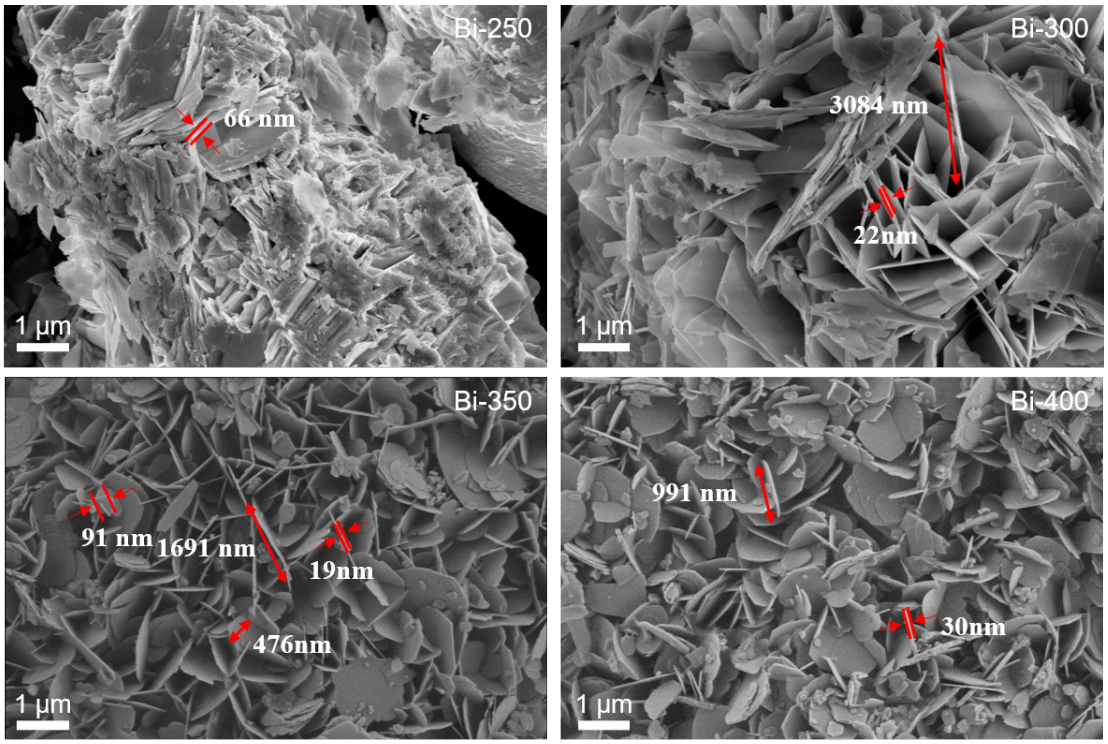

Fig.S10. SEM images of Bismuth NSs prepared at different temperatures.

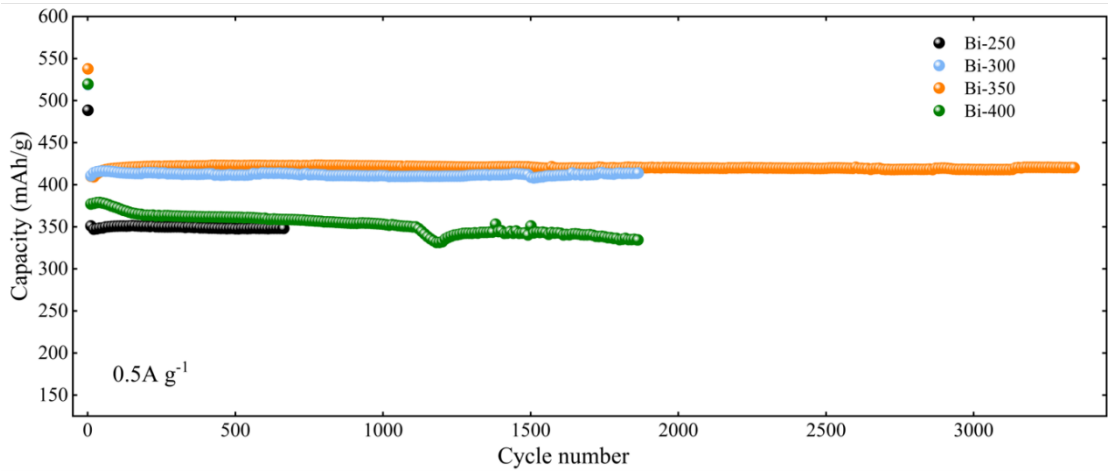

Fig.S11. Electrochemical performance of the Bismuth NSs prepared at different temperatures.

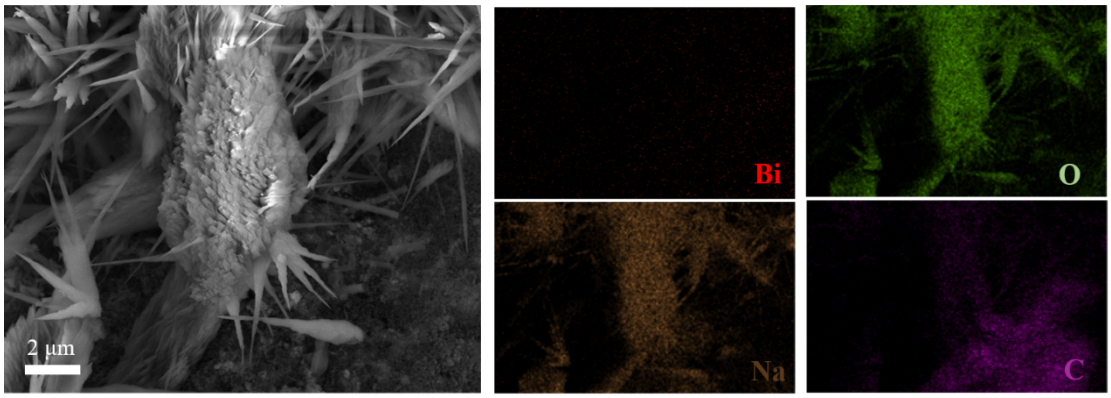

Fig.S12. SEM mappings of commercial bi powder electrodes.

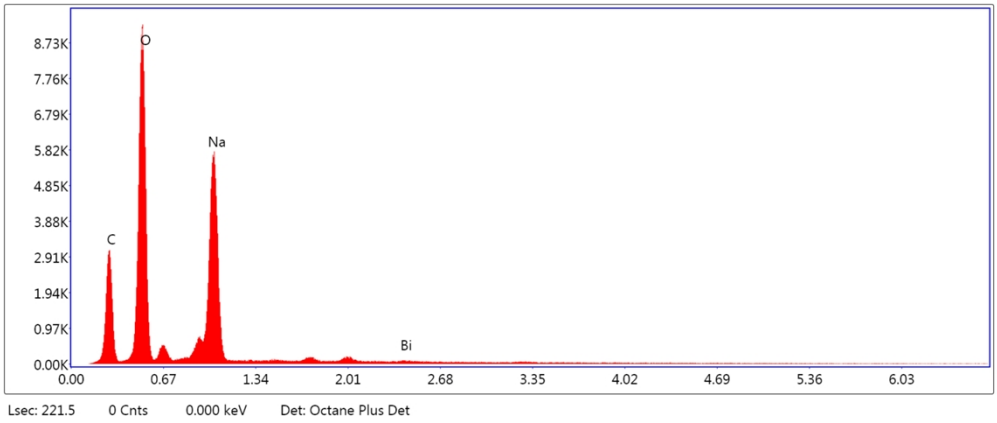

Fig.S13. Elemental mappings of commercial bi powder electrodes.

Table S2. The Elemental content of commercial bi powder electrodes.

Element	Weight %	Atomic %	Net Int.	Error %	Kratio	Z	R	A	F
C K	22.01	30.42	153.90	7.57	0.1141	1.0860	0.9748	0.4773	1.0000
O K	43.80	45.44	500.20	5.84	0.2818	1.0257	0.9939	0.6273	1.0000
NaK	33.35	24.08	398.00	4.84	0.2280	0.9183	1.0157	0.7438	1.0009
BiM	0.84	0.07	3.90	16.08	0.0059	0.5245	1.3583	1.1222	1.1815

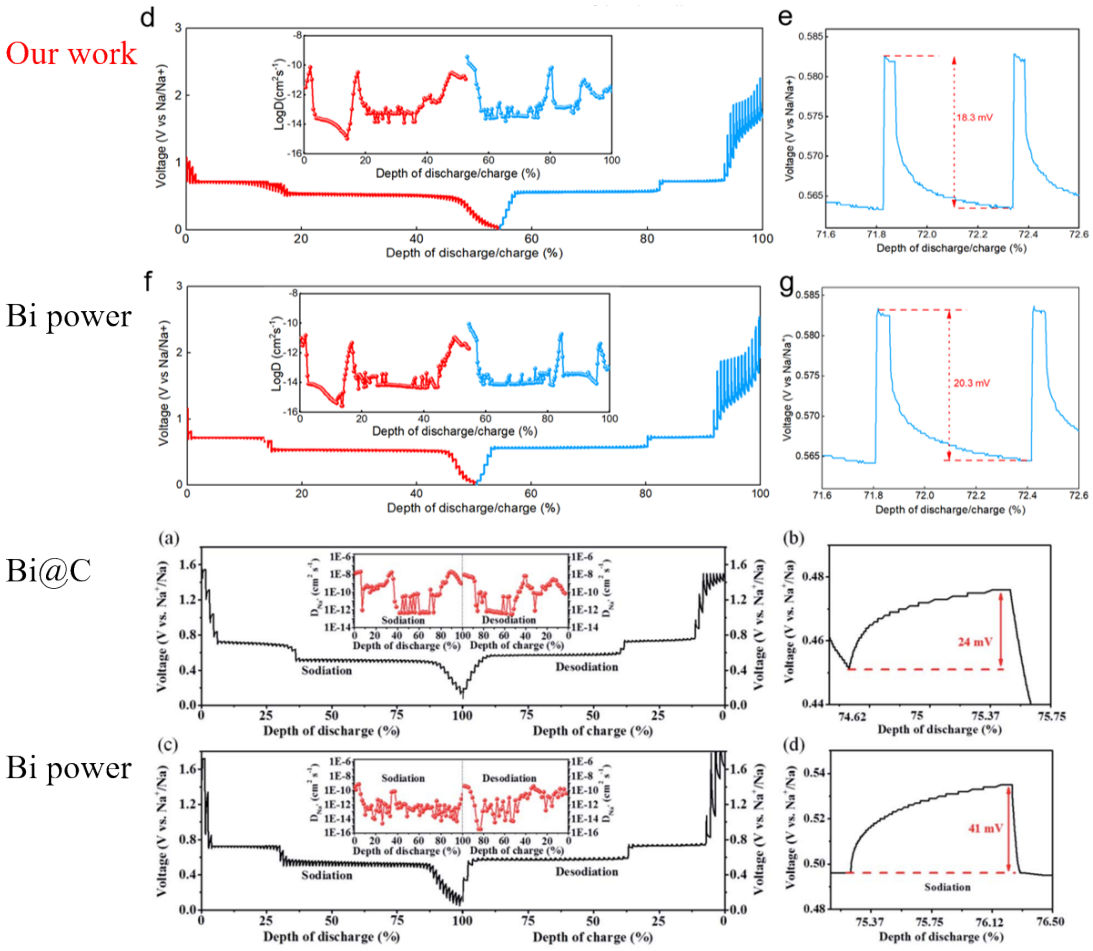

Fig.S14. Comparison of polarization values for different bismuth electrodes.