Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Na-Birnessite with High Capacity and Long Cycle Life for Rechargeable Aqueous Sodium-ion Battery Cathode Electrodes

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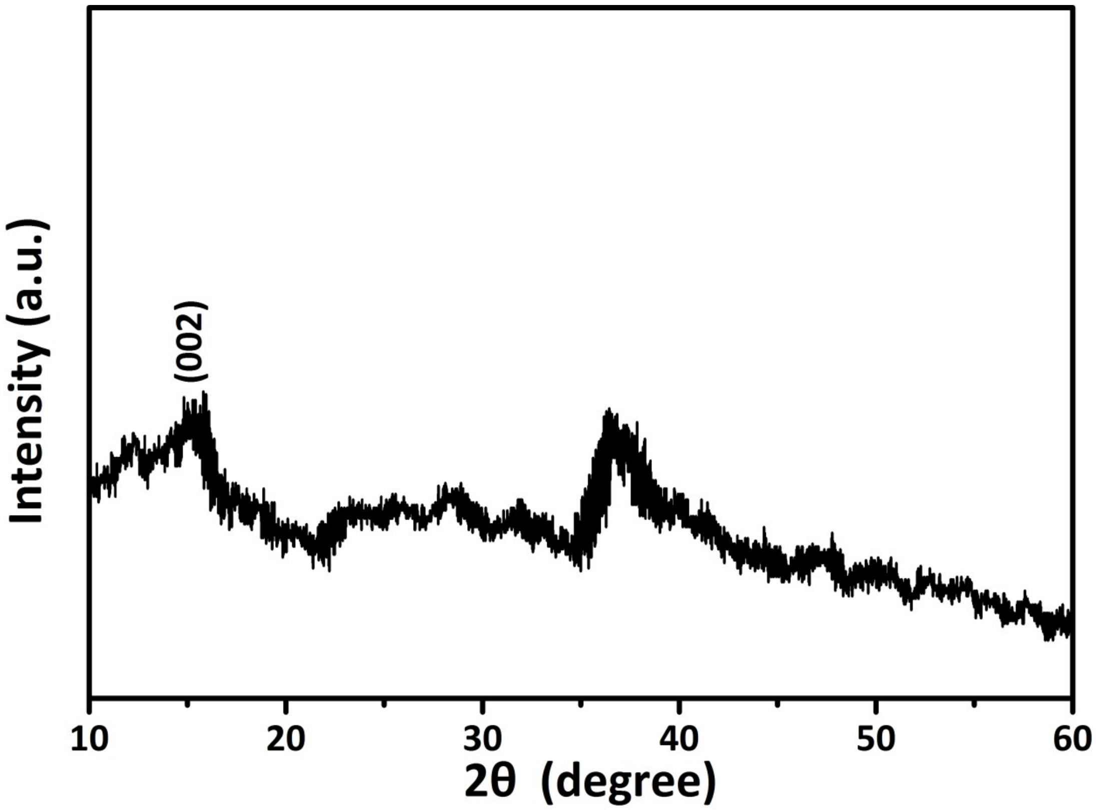

Fig. S1. X-ray powder diffraction (XRD) pattern of annealing Na-Bir sample.

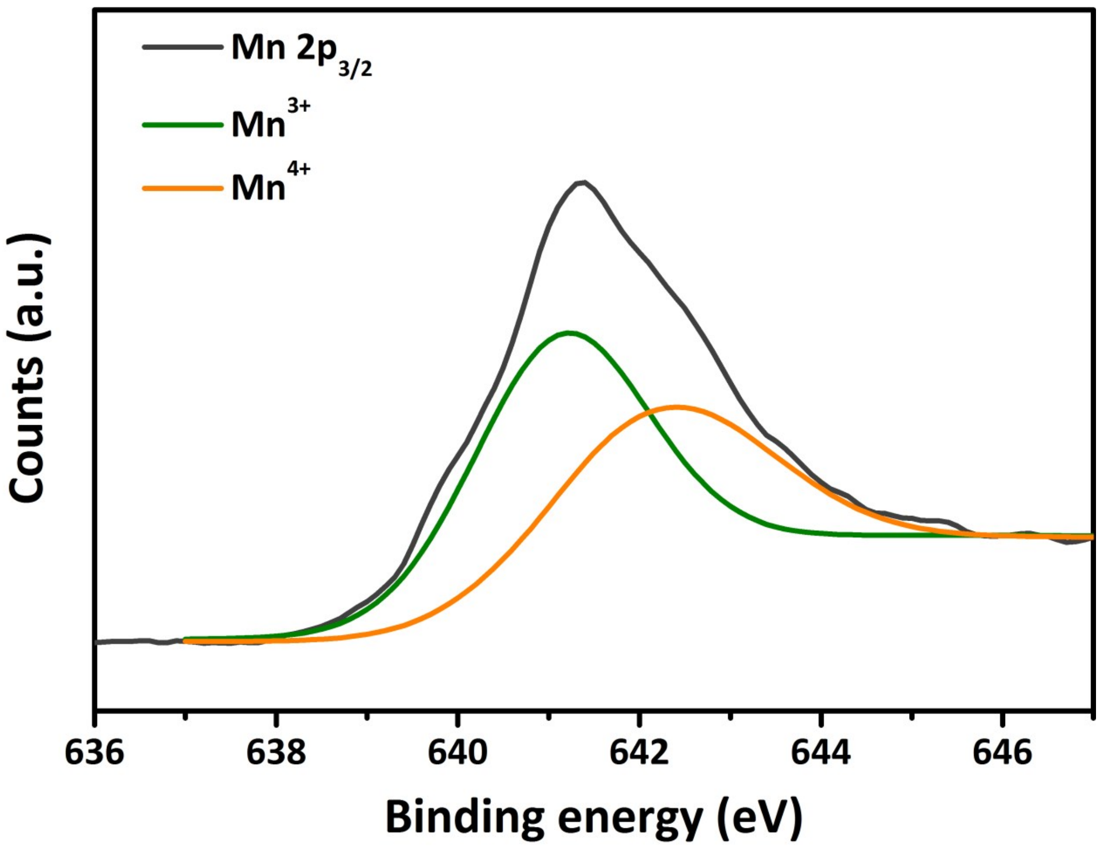

Fig. S2. X-ray photoelectron spectroscopy (XPS) spectra of as-synthesized Na-Bir material.

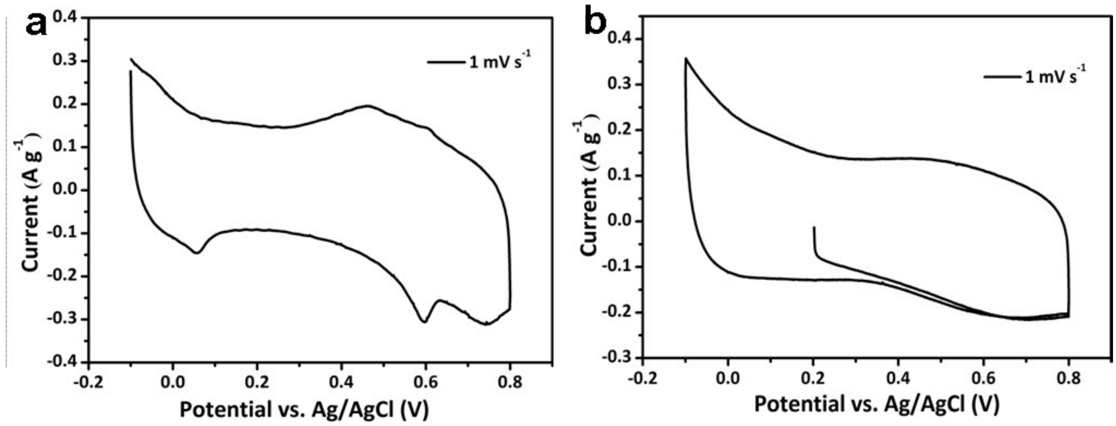

Fig. S3. Cyclic voltammetry (CV) curves of the Na-Bir (a) and annealing Na-Bir (b) electrodes in a voltage range of - 0.1 to 0.8 V at a scan rate of 1 mV s^{-1}.

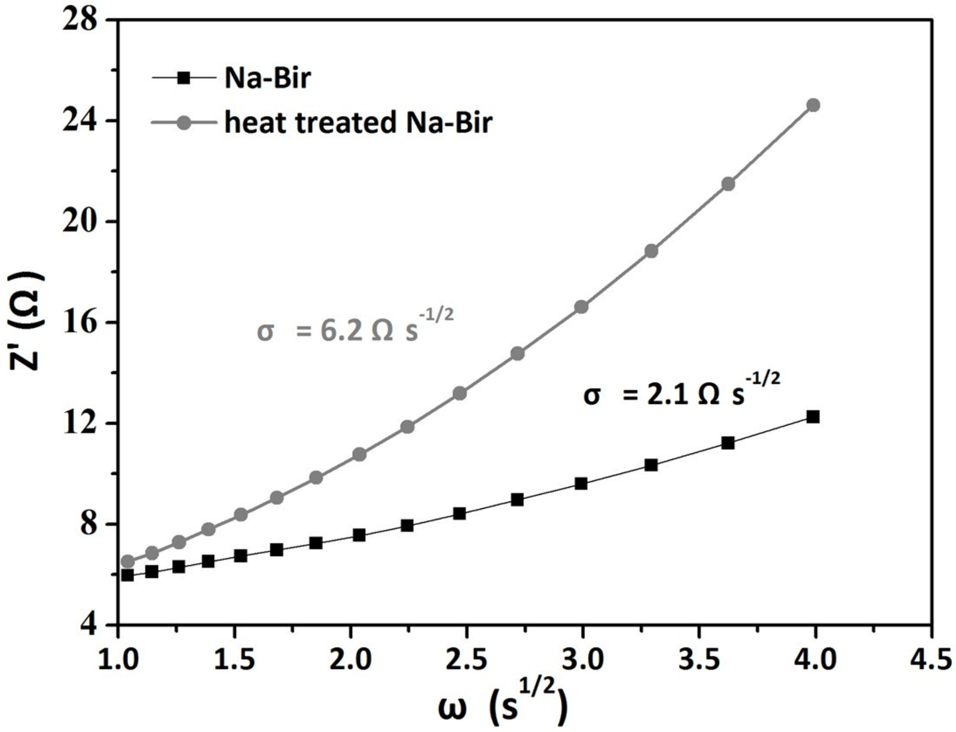

Fig. S4. The Warburg constant plots of Na-Bir and heat treated Na-Bir materials.

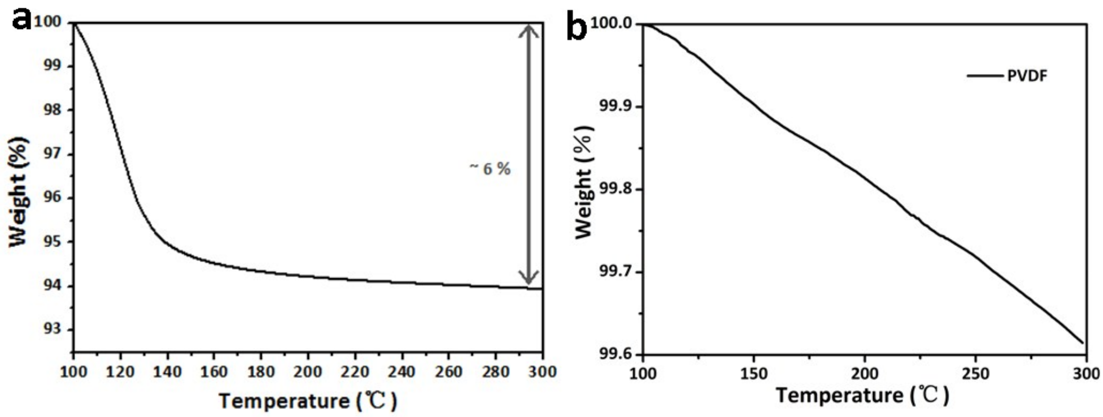

Fig. S5. Thermogravimetric analysis (TG) of the fully discharged Na-Bir after 150 cycles at 1 C rate (a) and (b) PVDF powder.

The TG profile of Na-Bir after 150 cycles was different from the pristine sample, which might be affected by the PVDF binder and conductive super P. The TG analysis of PVDF was shown in Fig. S4b. After remove the influence of PVDF and conductive super P, the TG profile of Na-Bir after 150 cycles should be identical to that of pristine sample.

Material (cathode/anode)	Capacity ($mAh\ g^{-1}$) (rate)	Cycle performance (capacity retention)	Refference
$Na_{0.44}MnO_2$/ $NaTi_2(PO_4)_3$	24 (7 C)	1600 (70%)	12
$K_{0.27}MnO_2$/ $NaTi_2(PO_4)_3$	40 (3 C)	100 (90%)	28
$Na_2NiFe(CN)_6$/ $NaTi_2(PO_4)_3$	40 (5 C)	250 (88%)	16
CuHCF/ MnHCMn	25 (10 C)	1000 (over 98%)	17c
$Na_{0.66}[Mn_{0.66}Ti_{0.34}]O_2$/ $NaTi_2(PO_4)_3$	40 (2 C)	300 (89%)	19
$Na_{0.58}MnO_2 \cdot 0.48H_2O$/ $NaTi_2(PO_4)_3$	39 (10 C)	1000 (94%)	This work

Table S1. Capacity and cycle performance of RASIB cathode materials.