

Supporting Information for

**An efficient bifunctional oxygen catalyst of CNT@FeCo-
C₃N₄&Ni₇Fe-LDH composite for rechargeable ammonium
ion-air battery**

Jin-Ge Fan^{a, b}, Jian-Min Pan^{a, b}, Han Wang^{a, b}, Yi Zhan^{a, b, *}, Tongwen Yu^{a, b, *}, Li Niu^{a, *}

^a School of Chemical Engineering and Technology, Southern Marine Science and Engineering Guangdong Laboratory (Zhuhai), Sun Yat-sen University, Zhuhai 519082, People's Republic of China

^b The Key Lab of Low-Carbon Chemistry & Energy Conservation of Guangdong Province, Sun Yat-sen University, Guangzhou 510275, People's Republic of China

E-mail: zhany9@mail.sysu.edu.cn; yutw@mail.sysu.edu.cn; niuli@mail.sysu.edu.cn

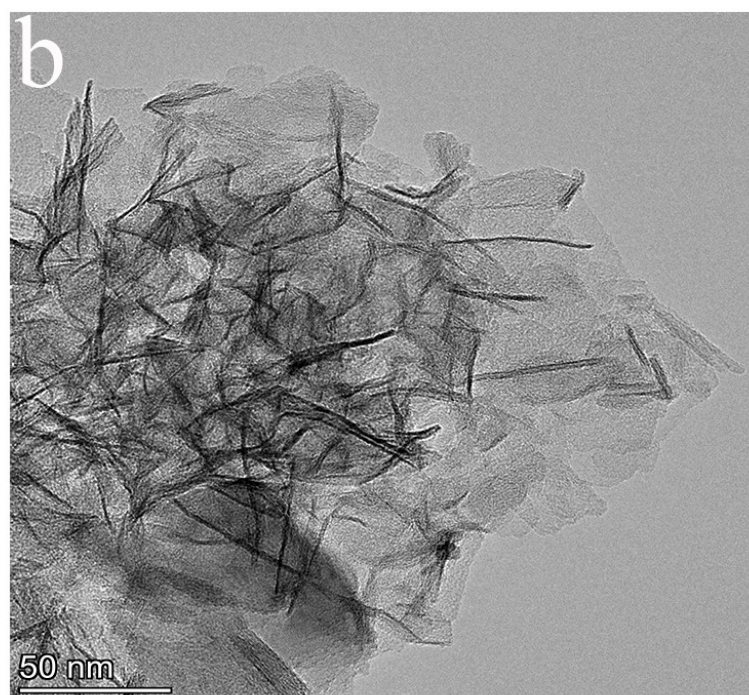
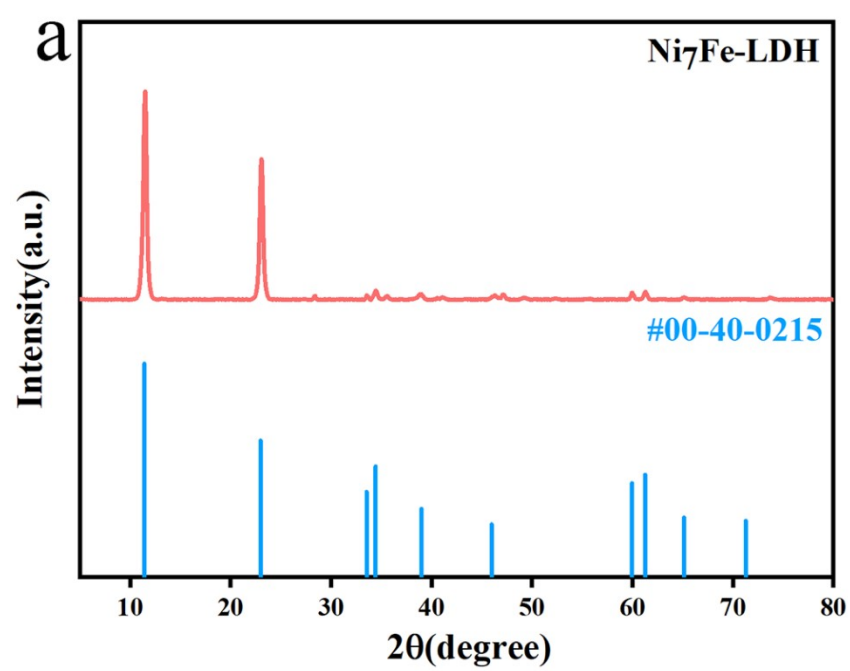


Figure S1. (a) XRD images of Ni₇Fe-LDH and XRD card of #00-40-0215. (b)TEM images of Ni₇Fe-LDH

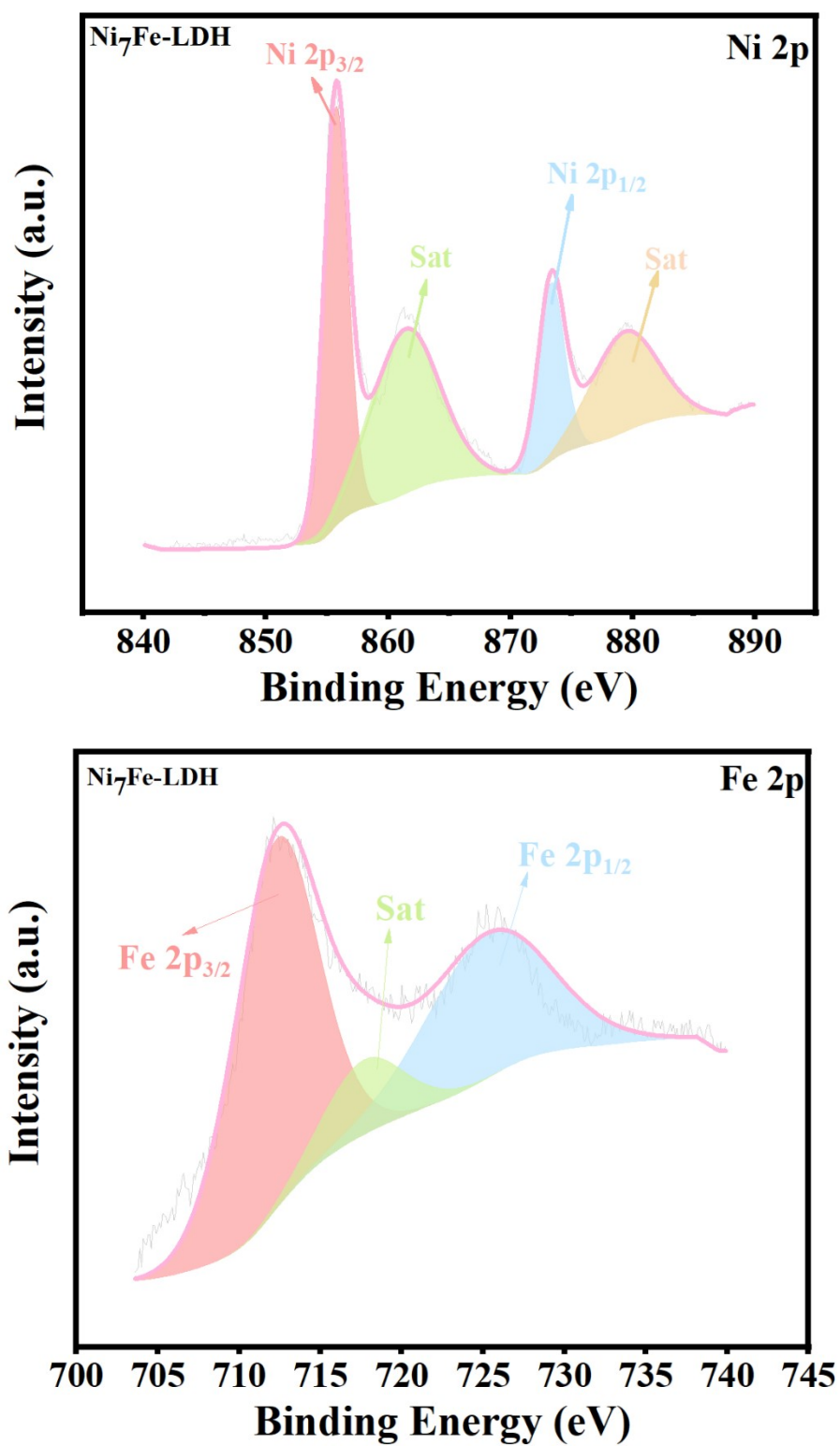


Figure S2 high-resolution XPS spectra of Ni 2p and Fe 2p of Ni₇Fe-LDH

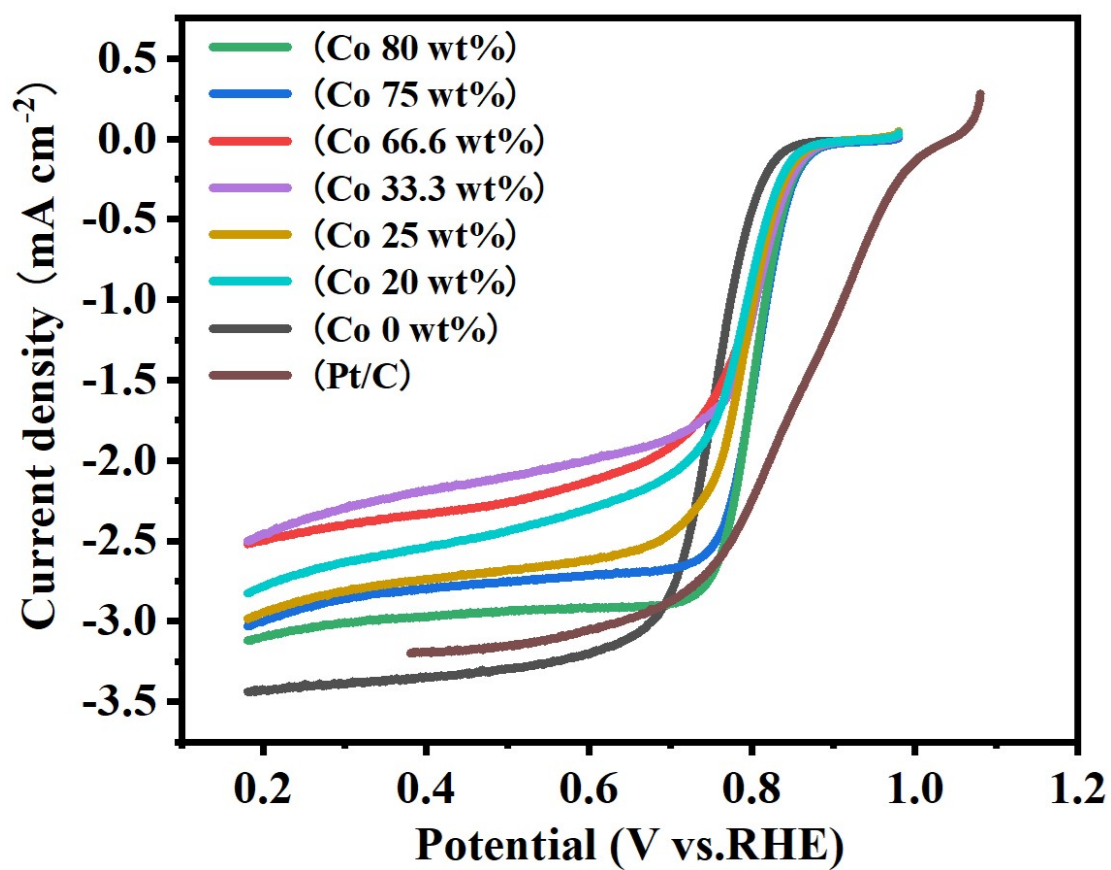


Figure S3. ORR LSV curves of different ratio of Co of CNT@FeCo-C₃N₄ in 0.1 mol · L⁻¹ KOH.

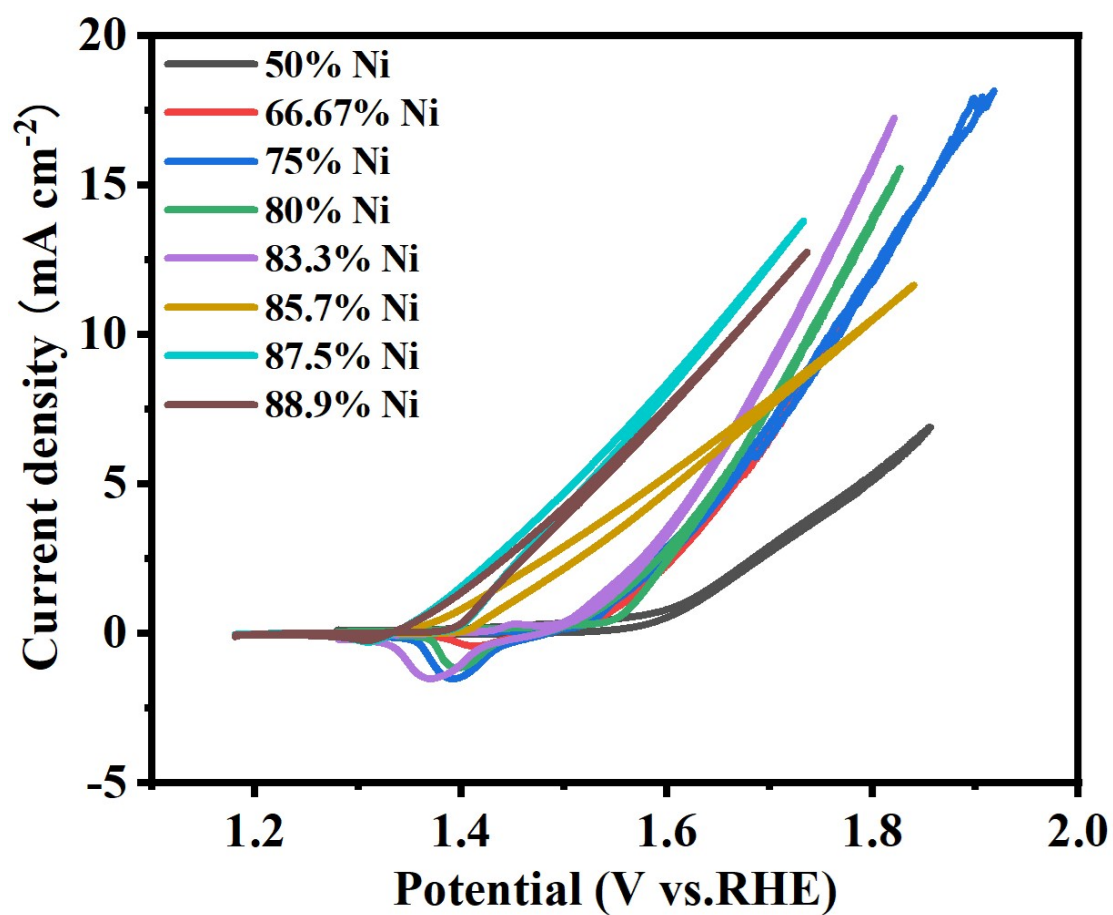


Figure S4. OER CV curves of NiFe-LDH with different amount of substance ratio of Ni and Fe. (the value is the percentage of nickel in the substance)

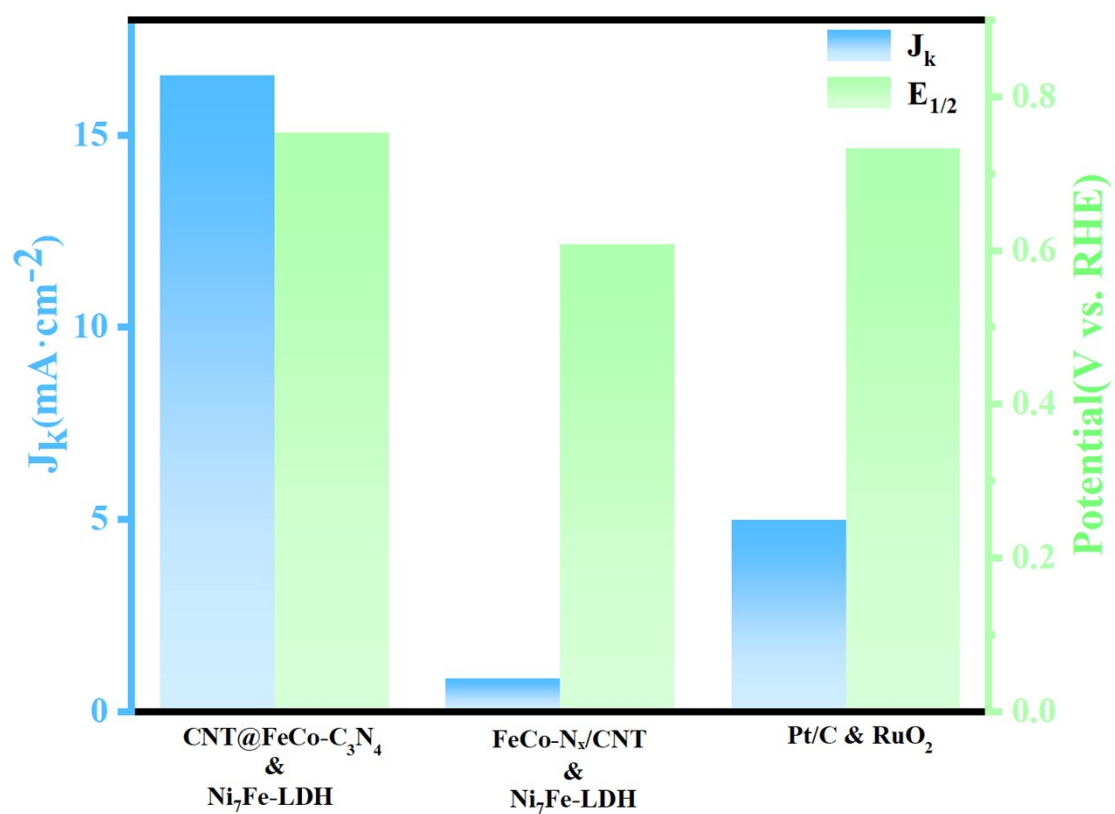


Figure S5. The kinetic current density (at $E_{1/2}$ of the corresponding catalyst) and $E_{1/2}$ of catalysts.

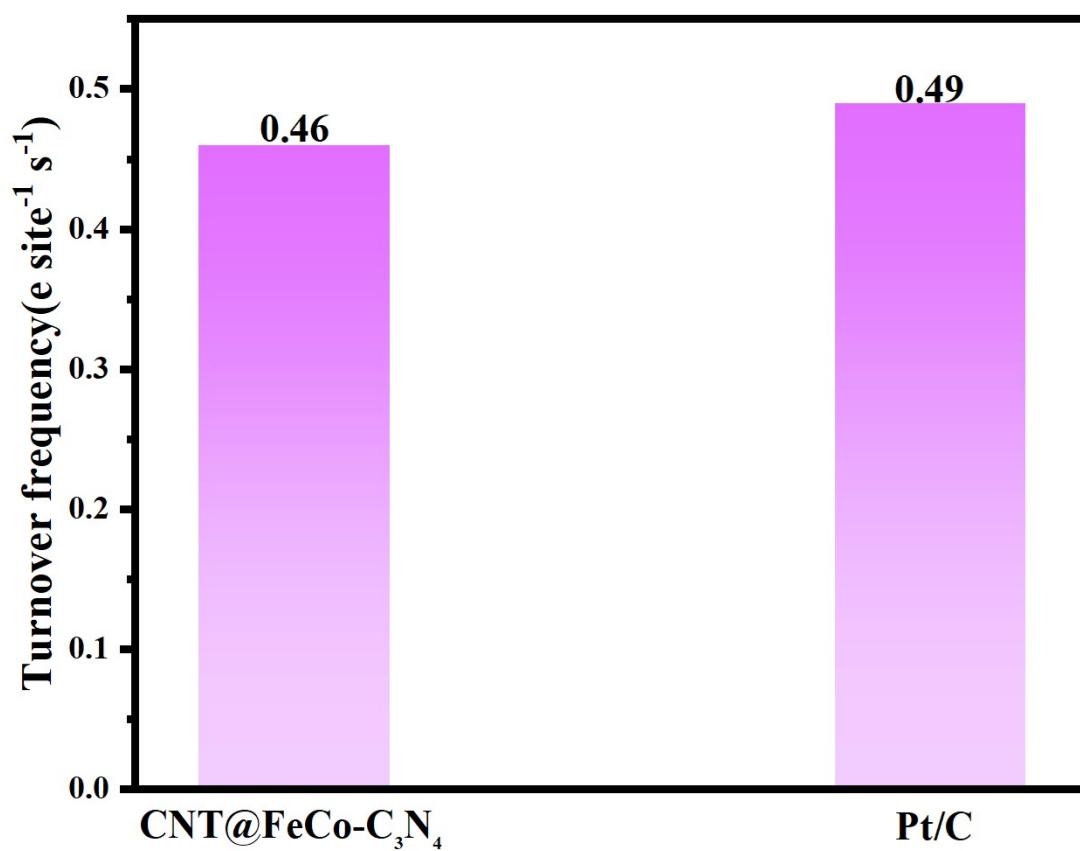


Figure S6. The TOF of different catalysts.

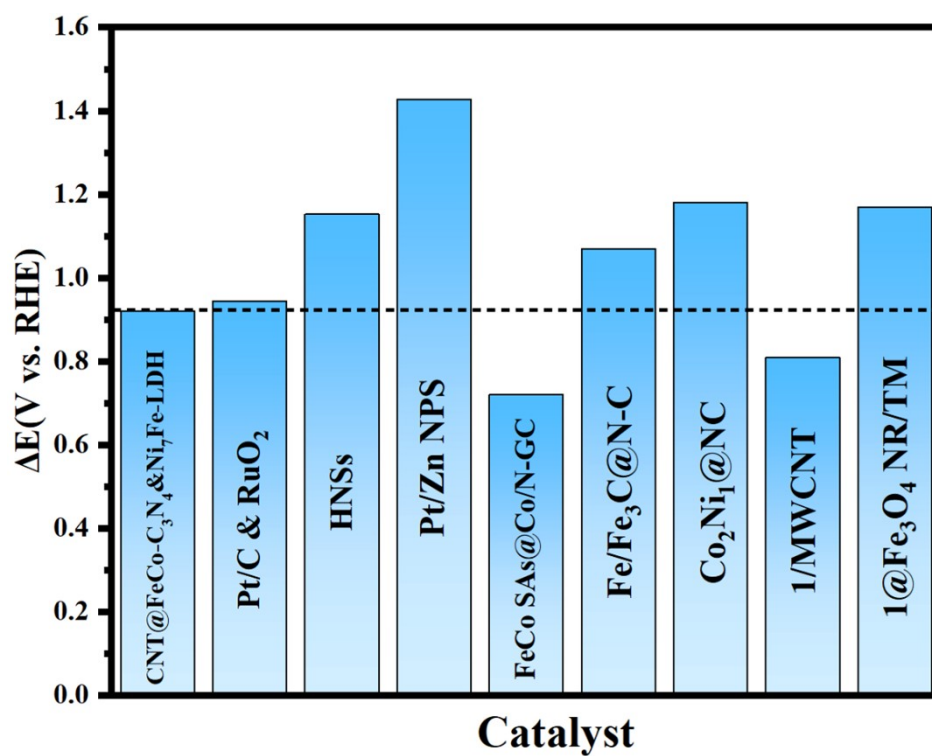


Figure S7. ΔE of the CNT@FeCo-C₃N₄ & Ni₇Fe-LDH catalyst and the previously reported catalysts.

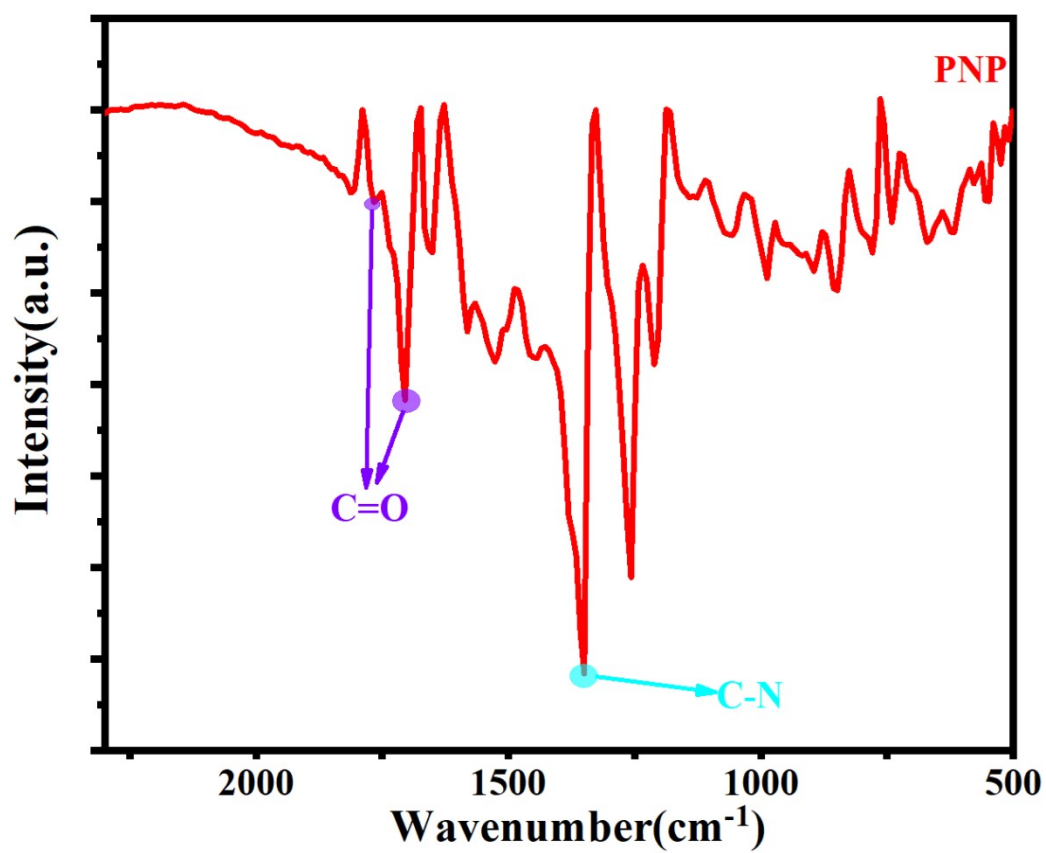


Figure S8. FTIR of PNP

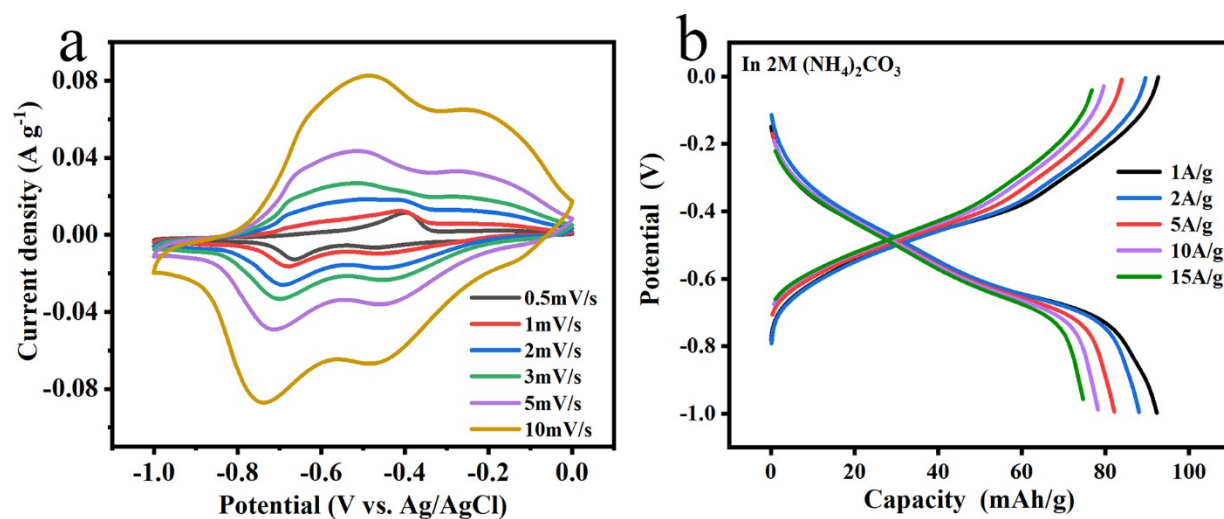


Figure S9. (a) CV curves of PNP anode at different scan rates; (b) GCD curves of PNP in 2M (NH₄)₂CO₃.

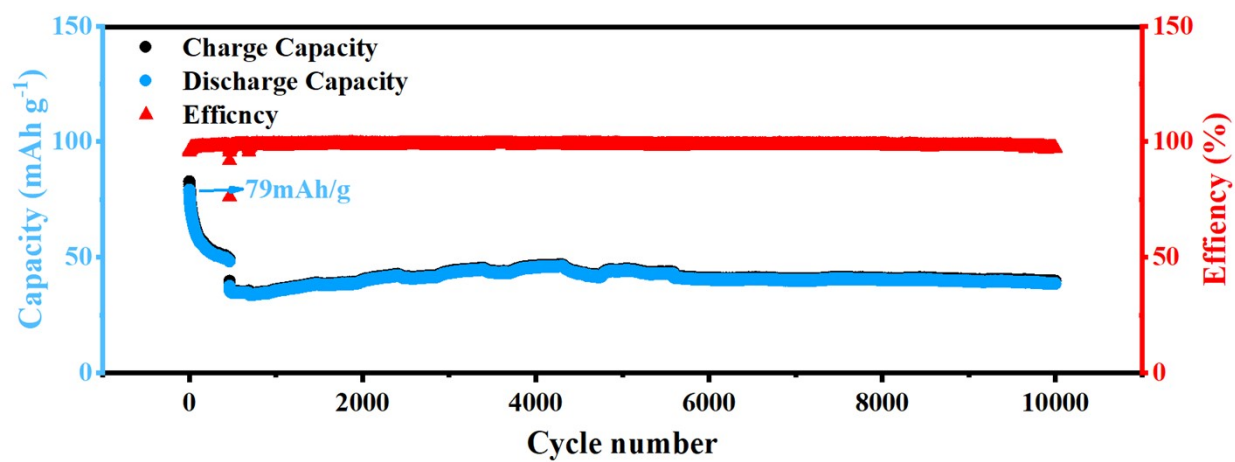


Figure S10. Long-term cycling stability of AIAB with Pt/C & RuO₂ as air cathode at 5 A g⁻¹.