Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Nickel cobalt selenides on black phosphorene with fast electron transportation for high-energy density sodium-ion half/full batteries

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Table of contents

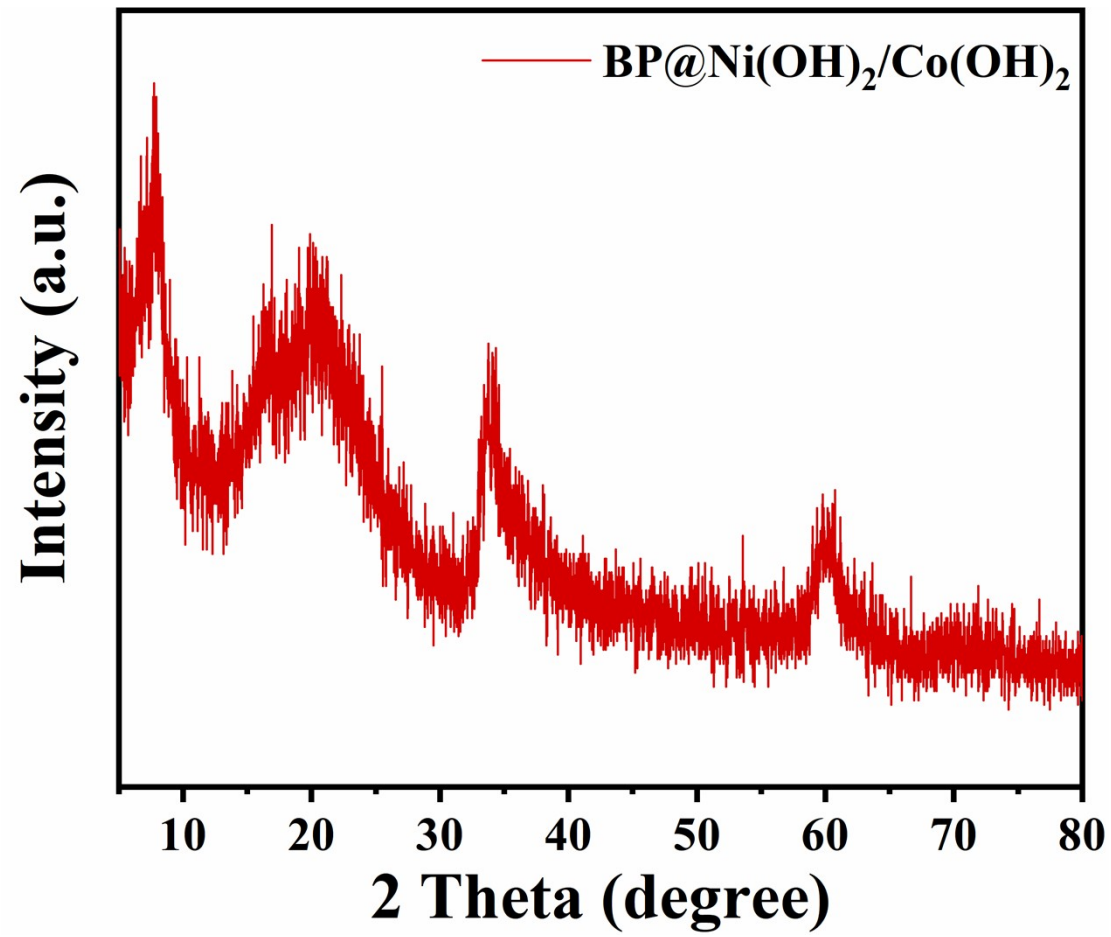


Fig S1. XRD pattern of BP@$Ni(OH)_2$/$Co(OH)_2$ precursor.

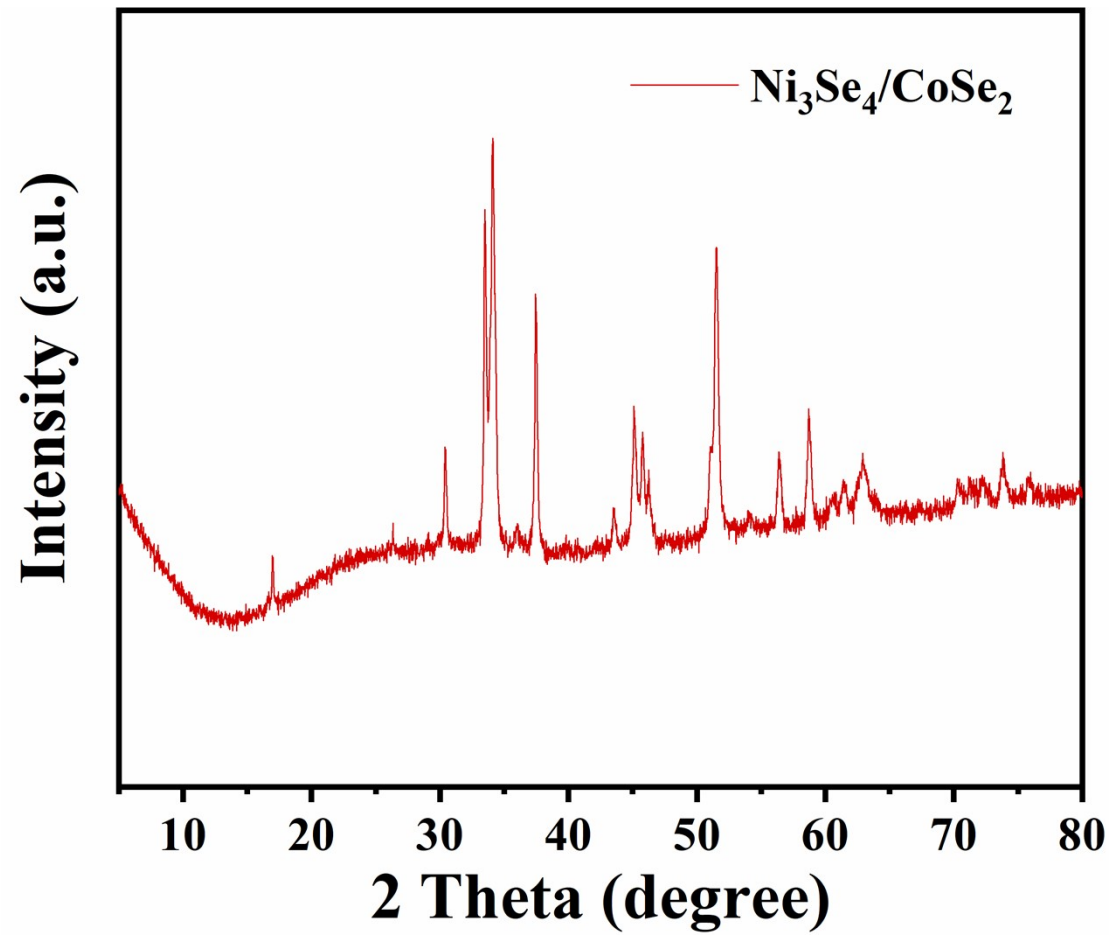


Fig S2. XRD pattern of as prepared pure $Ni_3Se_4/CoSe_2$.

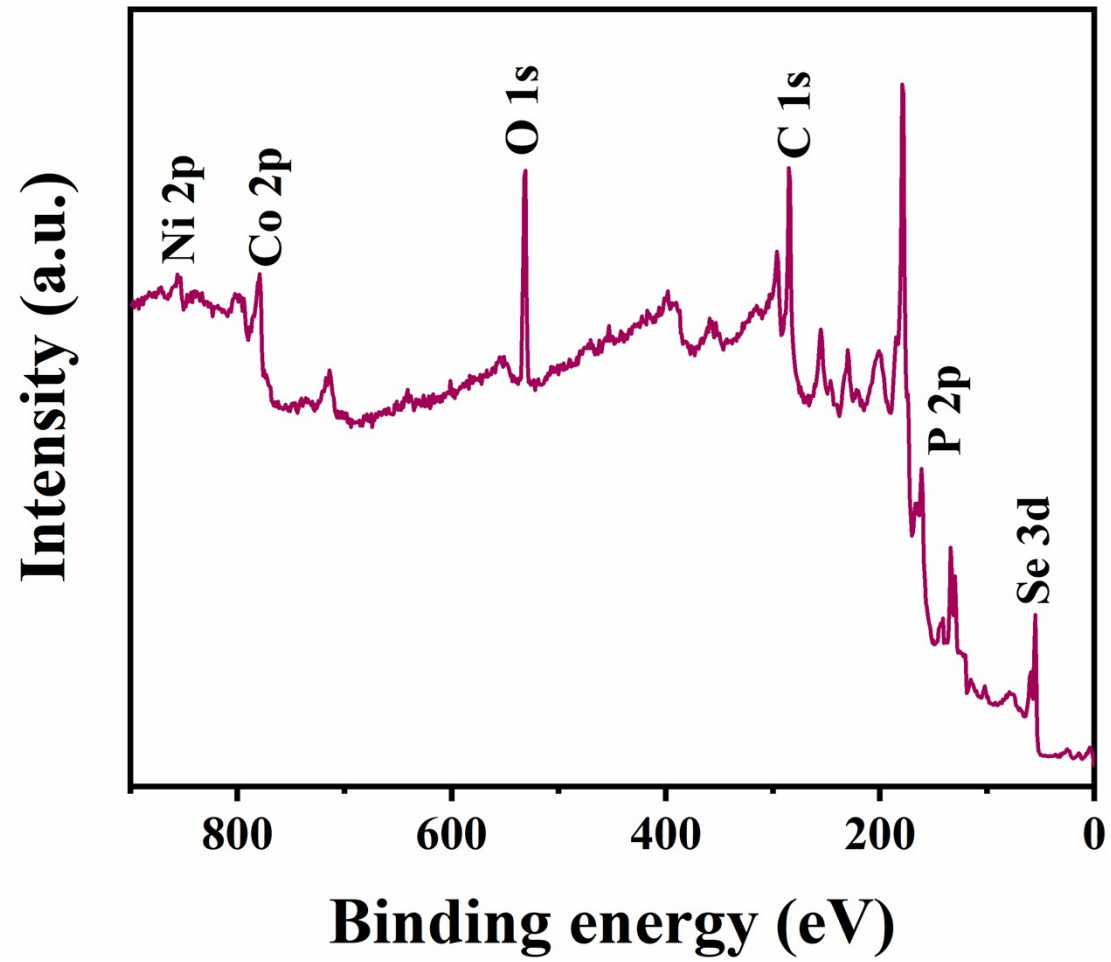


Fig S3. XPS survey spectrum of BP@Ni_3Se_4/$CoSe_2$.

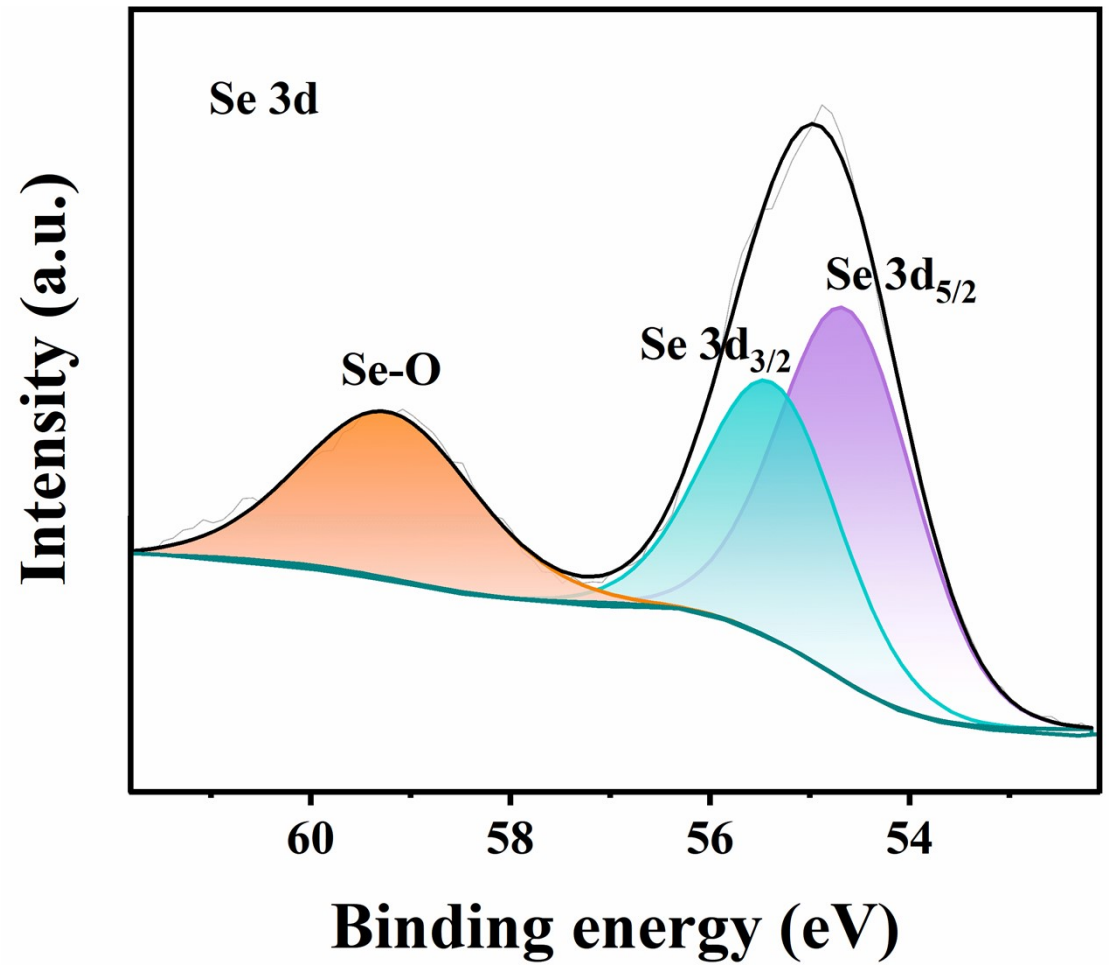
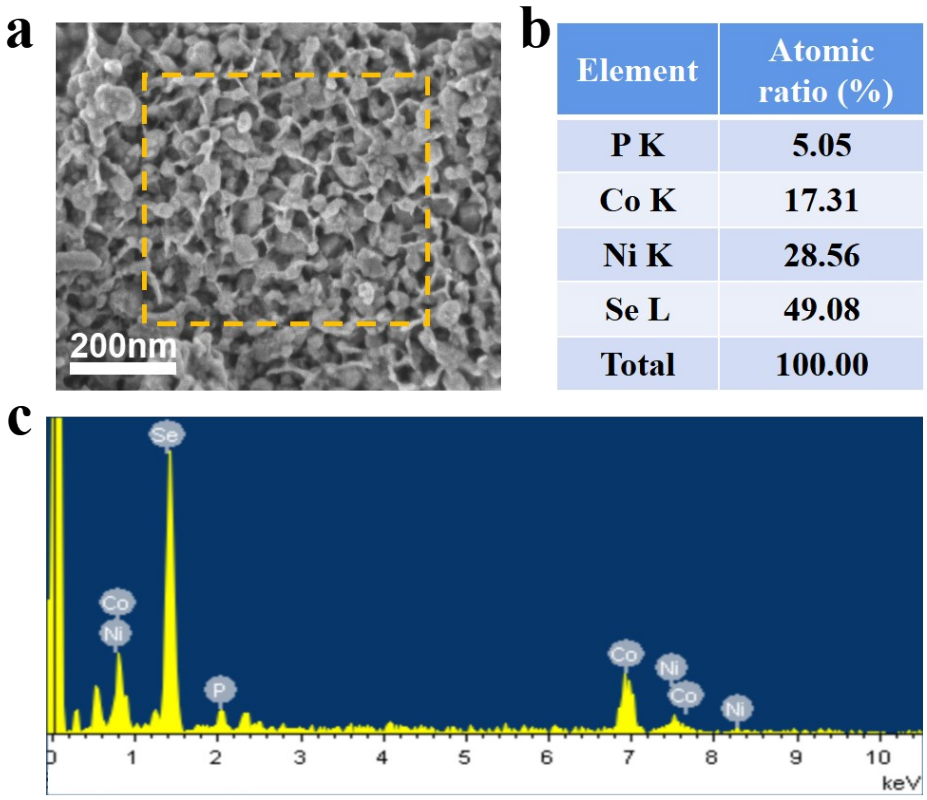


Fig S4. XPS spectra of Se 3d in BP@Ni_3Se_4/$CoSe_2$.



Element	Atomic ratio (%)
P K	5.05
Co K	17.31
Ni K	28.56
Se L	49.08
Total	100.00

Fig S5. Energy dispersive spectrometer (EDS) of BP@Ni_3Se_4/$CoSe_2$. The mole ratio of BP, Ni_3Se_4 and $CoSe_2$ is about 17.1 %, 31.1 %, 51.8 % based on the atomic ratio.

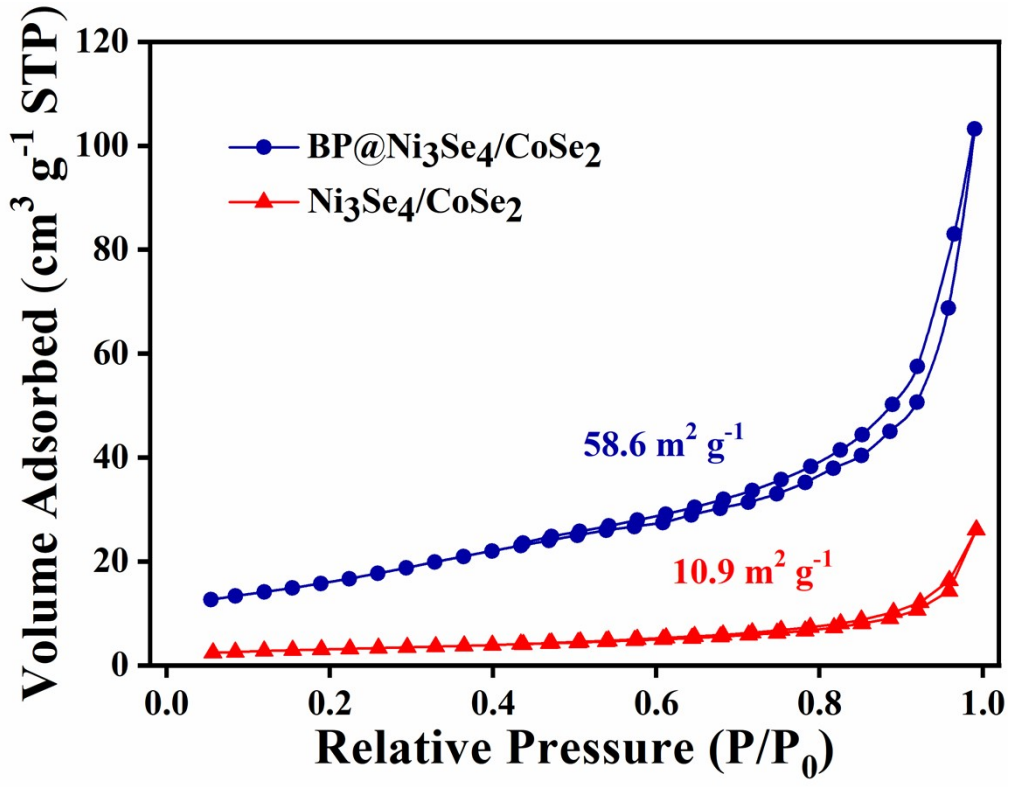


Fig S6. Nitrogen adsorption-desorption isotherms of BP@Ni_3Se_4/$CoSe_2$ and Ni_3Se_4/$CoSe_2$.

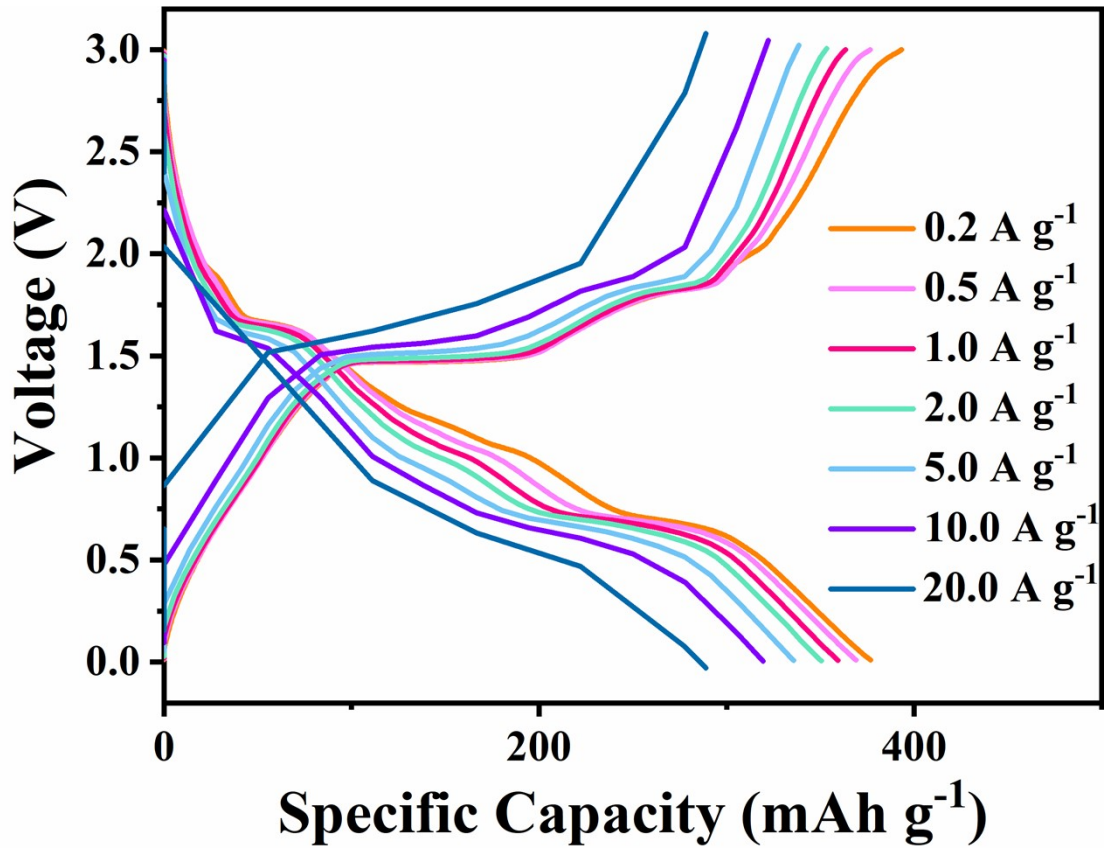


Fig S7. GCD curves of BP@Ni_3Se_4/$CoSe_2$ at different current densities.

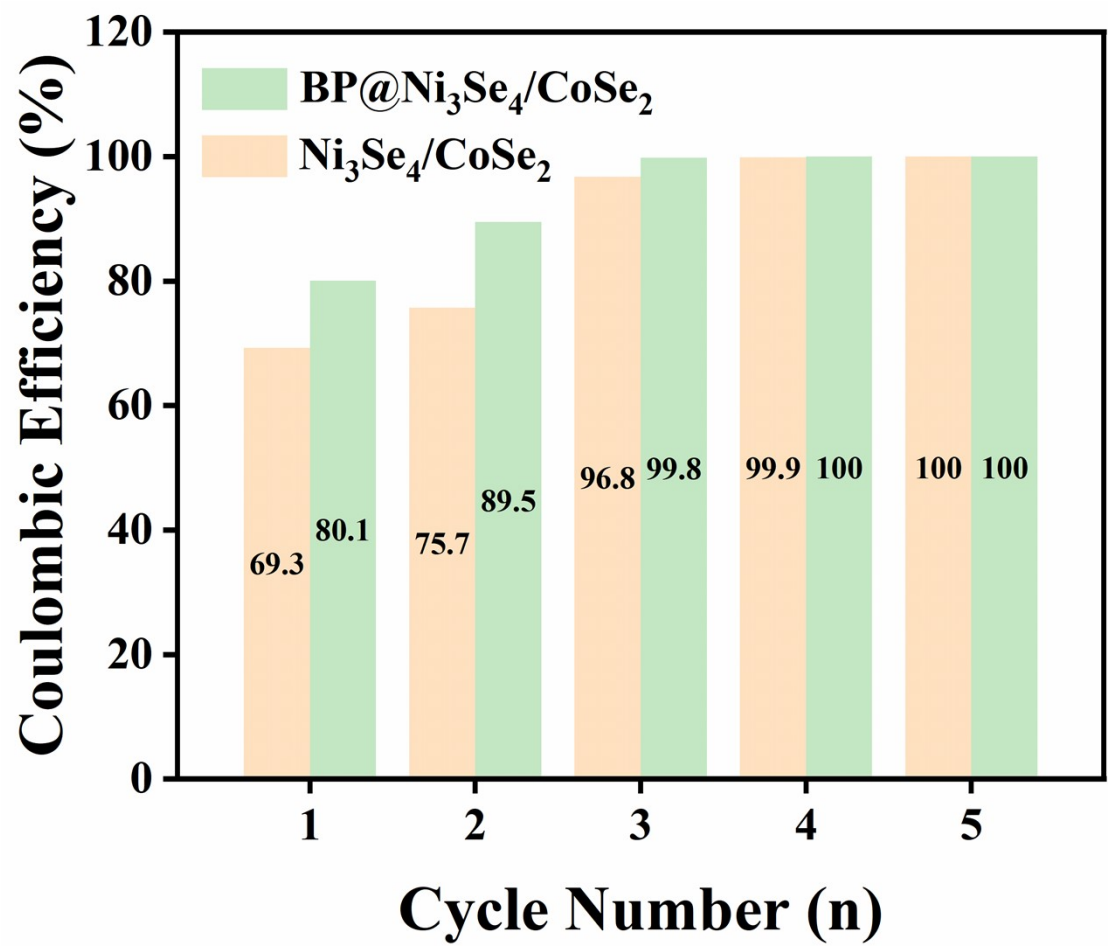


Fig S8. Comparison of coulombic efficiency for the first 5 cycles.

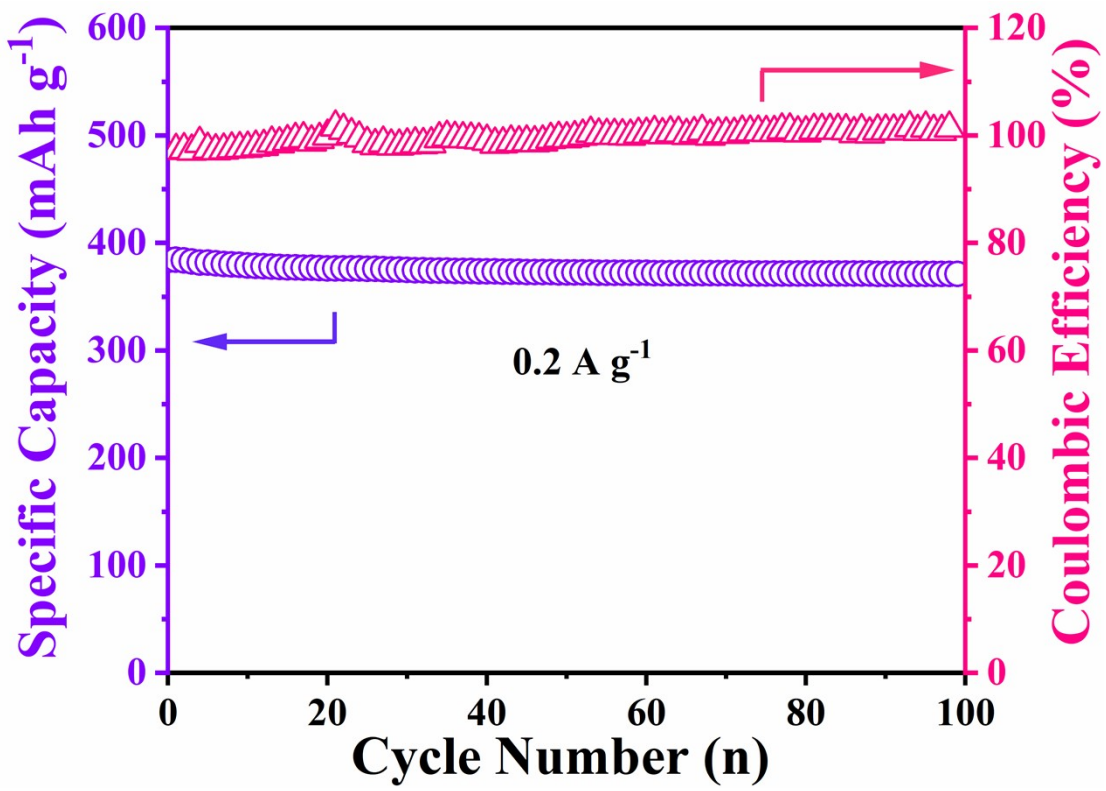


Fig S9. Cycling performance of BP@Ni_3Se_4/$CoSe_2$ at 0.2 A g^{-1}.

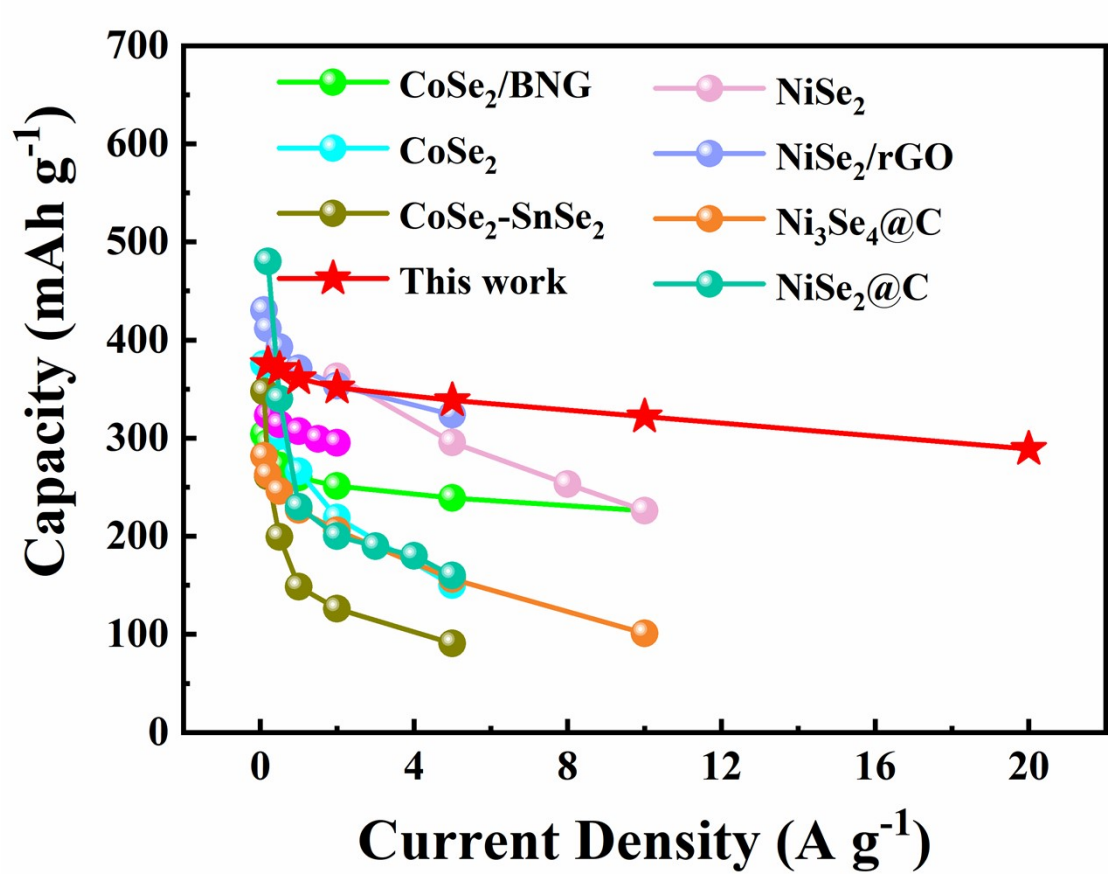


Fig S10. Rate performance comparison of previously reported transition metal selenide-based electrode.

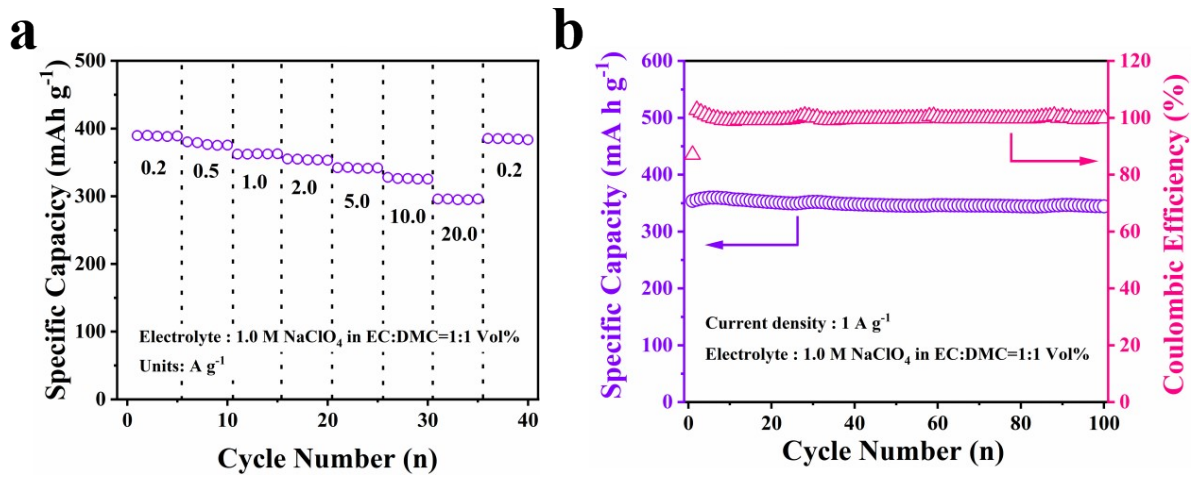


Fig S11. Rate and cycle stability of BP@$Ni_3Se_4/CoSe_2$ using $NaClO_4$ in EC/DMC as electrolyte.

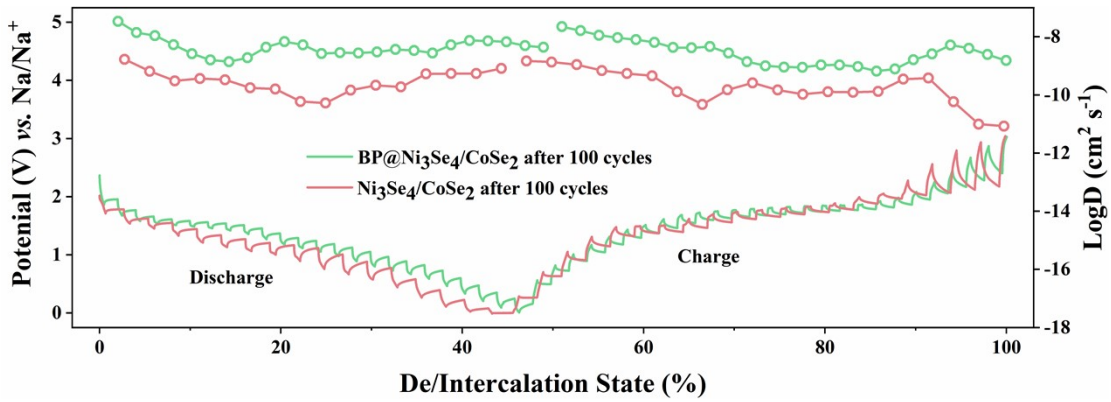


Fig S12. Comparison of GITT curves of the cycled electrode.

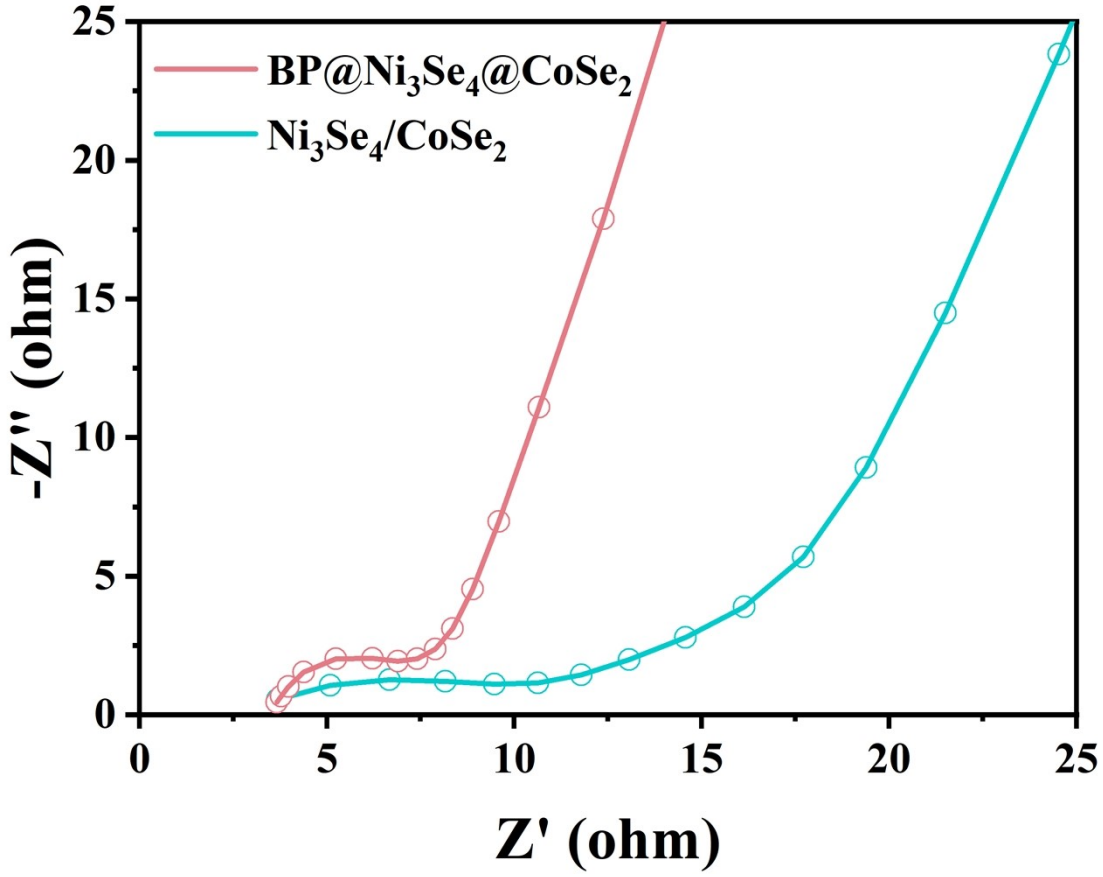


Fig S13. Nyquist plots for the electrodes of BP@Ni_3Se_4/$CoSe_2$ and pure Ni_3Se_4/$CoSe_2$.

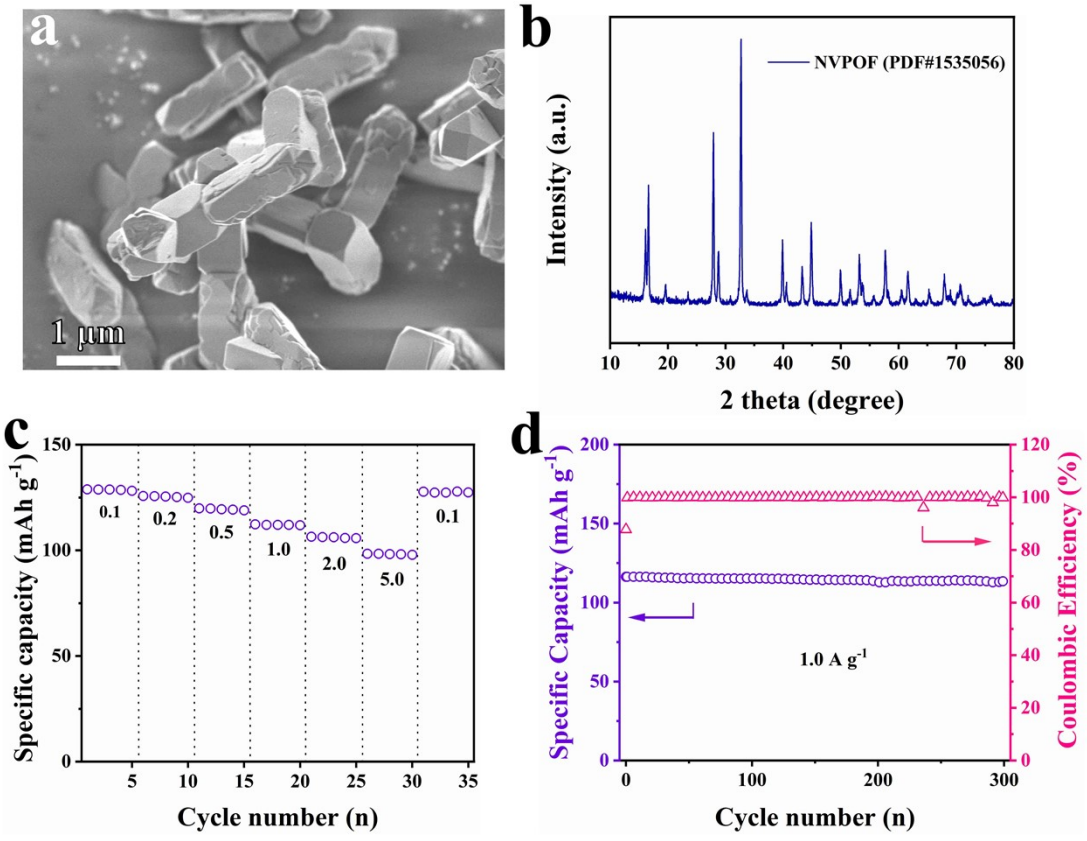


Fig S14. Characterization of NVPOF. (a) SEM image. (b) XRD pattern. (c) rate performance and (d) cycle stability.