

Supplementary Information

Pliable Electrode of Porous Graphene-Encapsulated FeNiSe₄ Binary-Metal Selenide Nanorods as Binder-free Anode for Lithium-Ion Batteries

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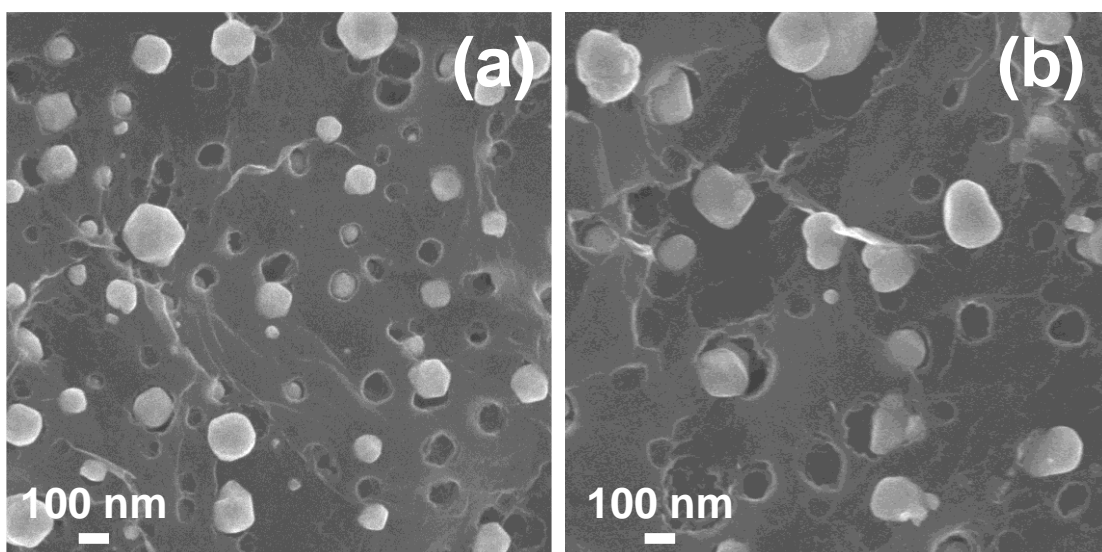


Fig. S1 SEM images of (a) Ni/PG and (b) NiSe₂/PG.

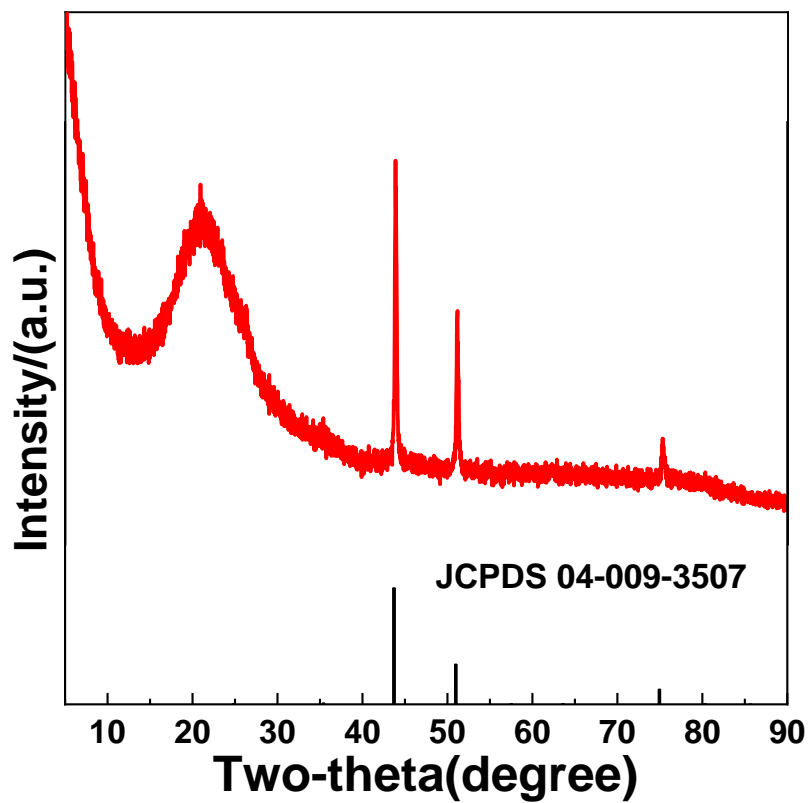


Fig. S2 XRD pattern of FeNi@PG.

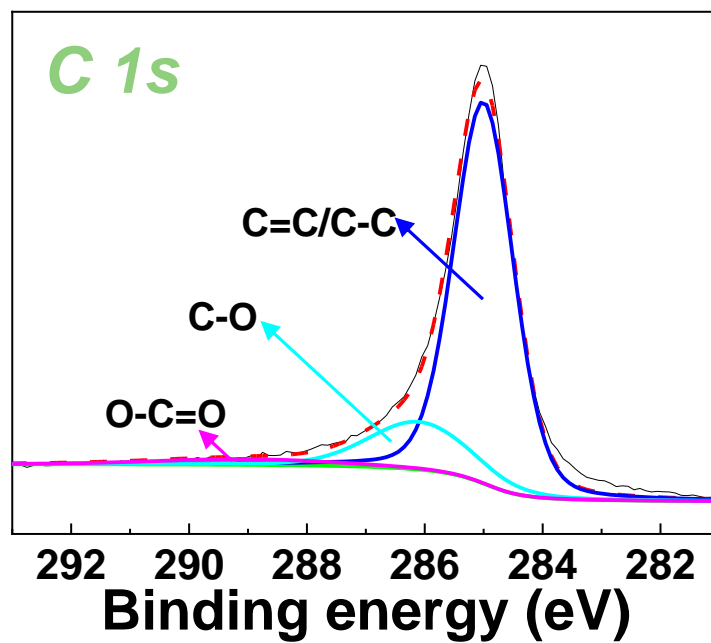


Fig. S3 C1s spectrum of FeNiSe₄@PG.

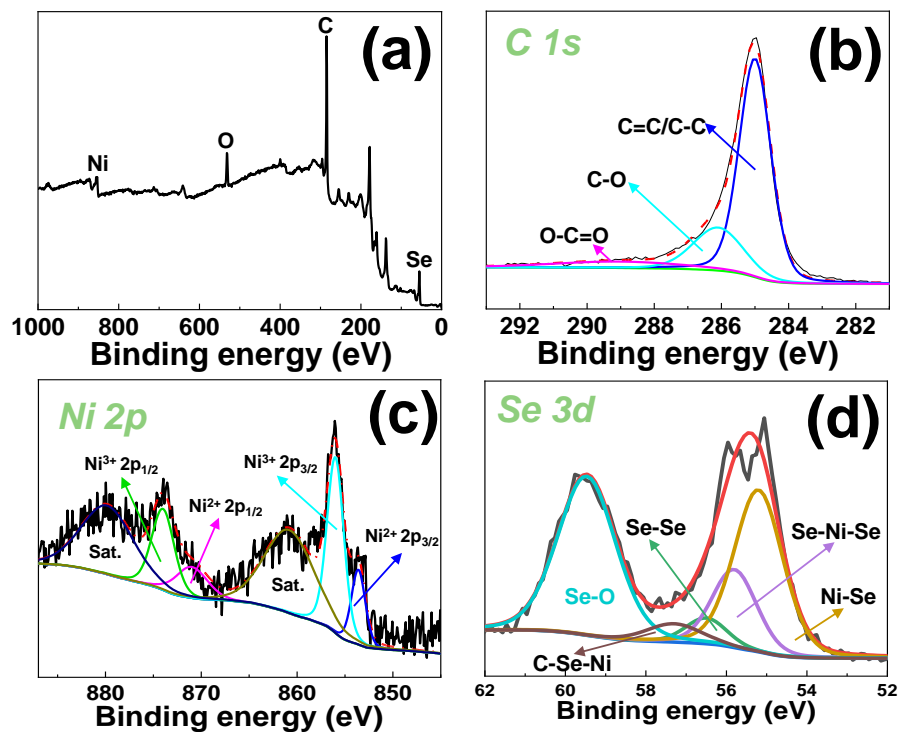


Fig. S4 (a) XPS spectrum of NiSe₂/PG and its (b) C 1S, (c) Ni 2p, and (d) Se 3d spectra.

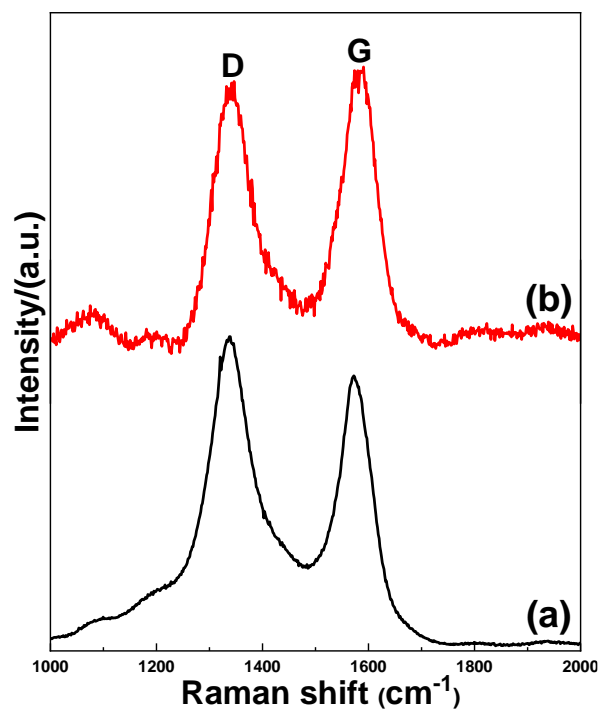


Fig. S5 Raman spectra of (a) NiSe₂/PG and (b) FeNiSe₄@PG.

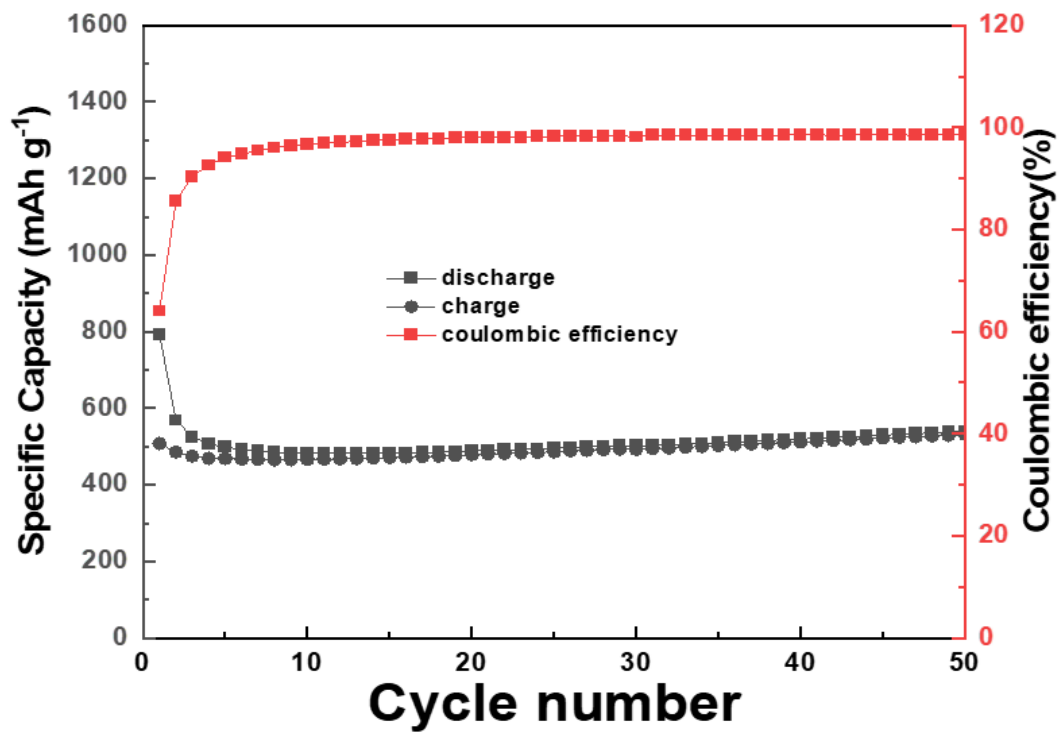


Fig. S6 The cycle performance and coulombic efficiency of FeSe₂/PG at 100 mA g⁻¹.

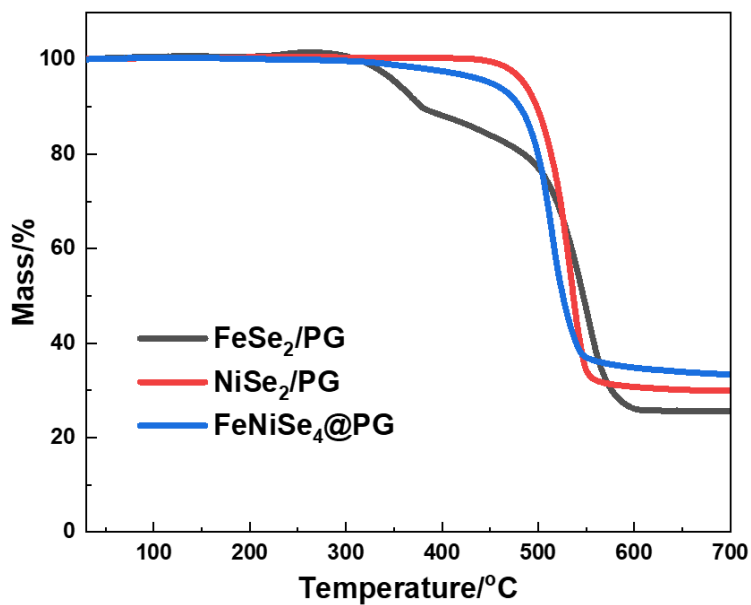


Fig. S7 TG curves of (a) FeNiSe₄@PG, (b) NiSe₂/PG, and (c) FeSe₂/PG.

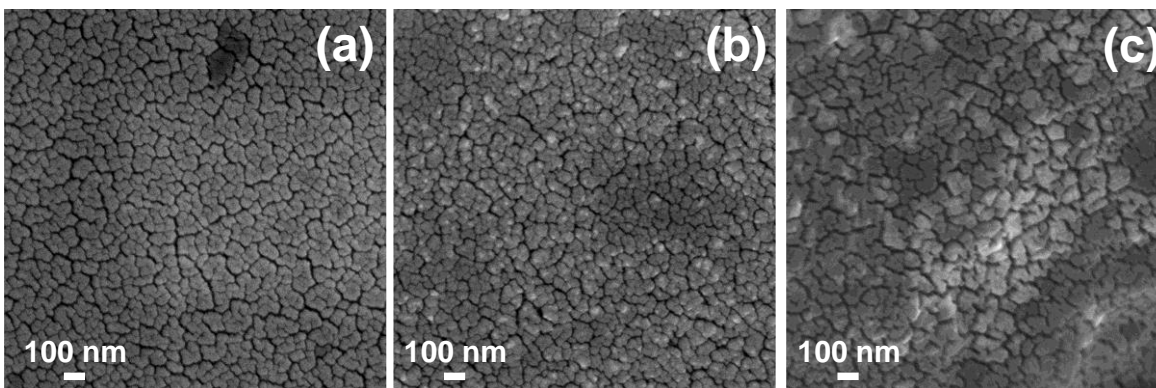


Fig. S8 SEM images of (a) FeNiSe₄@PG, (b) NiSe₂/PG, and (c) FeSe₂/PG electrodes after cycling at 100 mA g⁻¹.

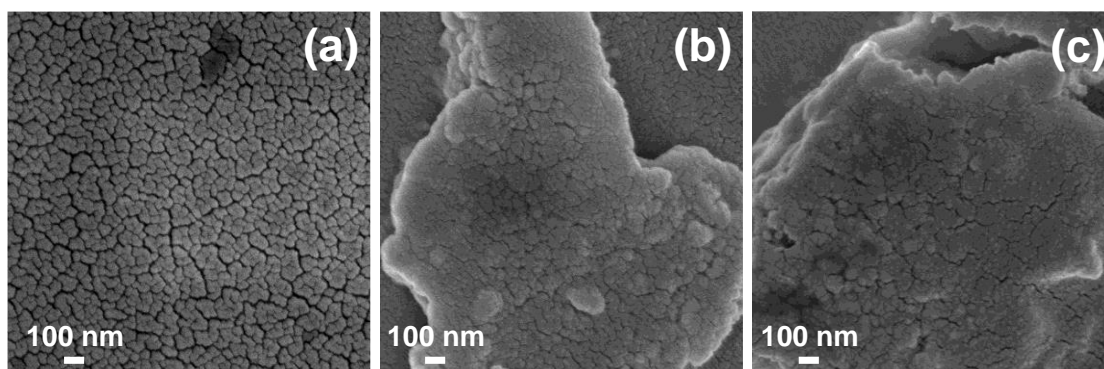


Fig. S9 SEM images of (a) FeNiSe₄@PG electrodes after cycling at (a) 100 mA g⁻¹, (b) 1 Ag⁻¹, and (c) 5 Ag⁻¹.

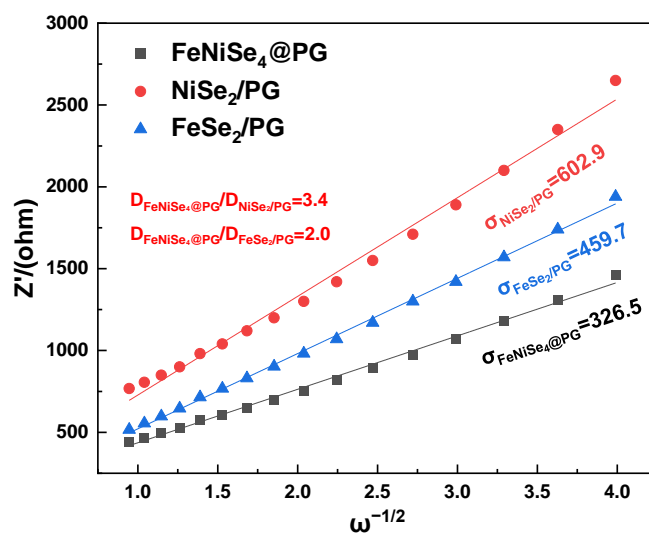


Fig. S10 Relationship between Z' and $\omega^{-1/2}$ for FeNiSe₄@PG, NiSe₂/PG, and FeSe₂/PG.

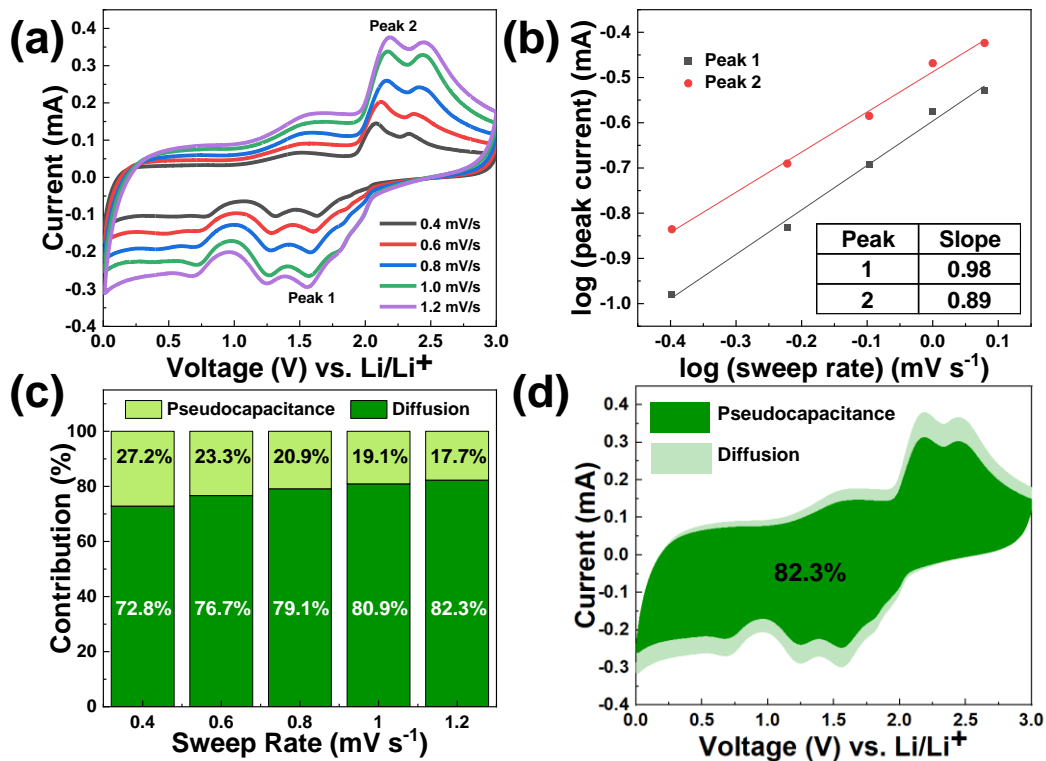


Fig. S11 (a) CV curves at various sweep rates and (b) corresponding log(peak current)-log(sweep rate) plots for FeNiSe₄@PG electrode. c) Pseudocapacitive contributions for the FeNiSe₄@PG electrode at various sweep rates. d) Pseudocapacitive and diffusion-controlled contribution for the FeNiSe₄@PG electrode at 1.2 mV s⁻¹

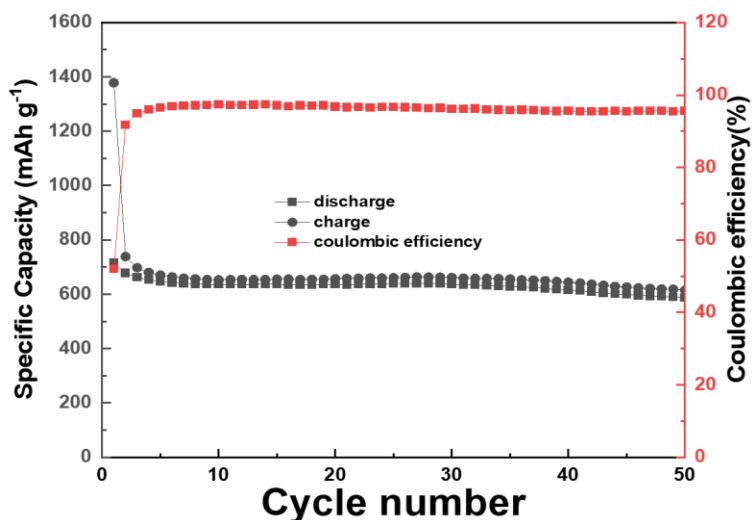


Table S1 The electrolyte resistance, SEI film resistance, and charge-transfer resistance of NiSe₂/PG and FeNiSe₄@PG.

| | NiSe ₂ /PG | FeNiSe ₄ @PG |
|--------------------------------|-----------------------|-------------------------|
| The electrolyte resistance | 2.266 | 3.223 |
| The SEI film resistance | 19.88 | 20.01 |
| The charge-transfer resistance | 107.7 | 51.1 |