

Supporting Information for

In-Situ Monitoring the Potassium Ion Storage Enhancement in Iron Selenide with Ether-Based Electrolyte

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Supplementary Tables and Figures

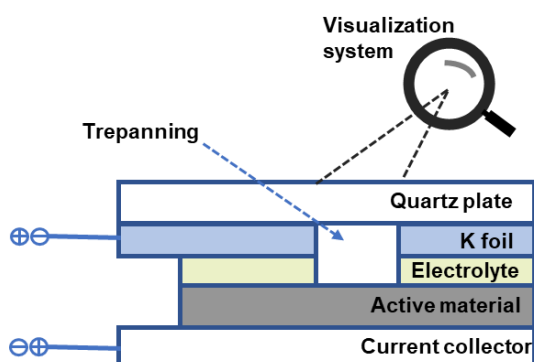


Fig. S1 Detail testing schematic of in-situ visualization

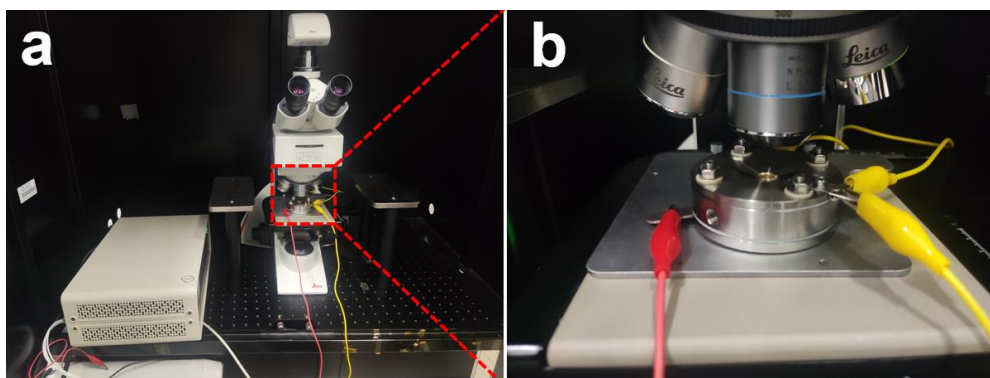


Fig. S2 Photograph of in-situ visualization testing system

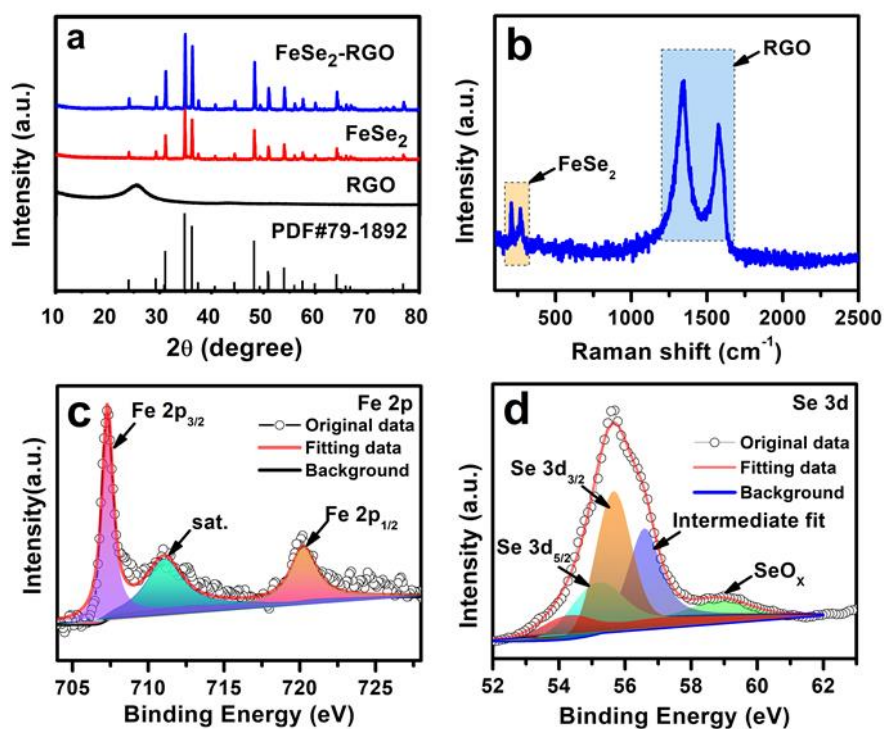


Fig. S3 (a) XRD patterns of RGO, FeSe₂ and FeSe₂@RGO; (b) Raman spectrum of FeSe₂@RGO; (c) Fe 2p and (d) Se 3d XPS spectra of FeSe₂@RGO

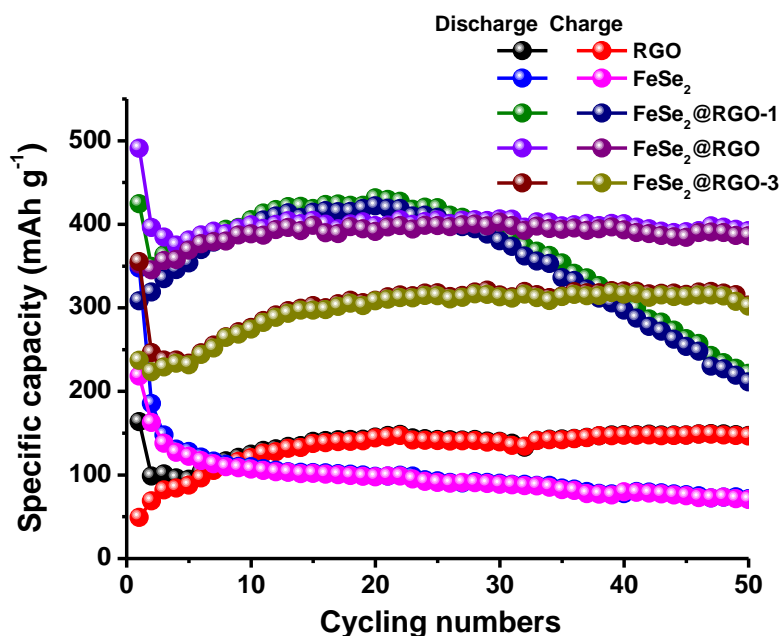


Fig. S4 Cycling performance of RGO, FeSe₂, FeSe₂@RGO-1, FeSe₂@RGO and FeSe₂@RGO-3 with DME-based electrolyte at a current density of 100 mA g⁻¹

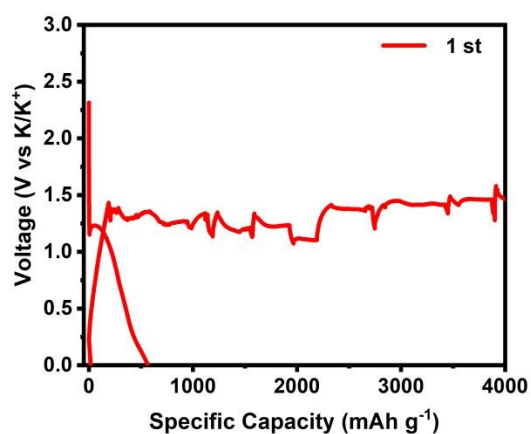


Fig. S5 GCD curves of FeSe₂-RGO electrode using DME- 1 based electrolyte

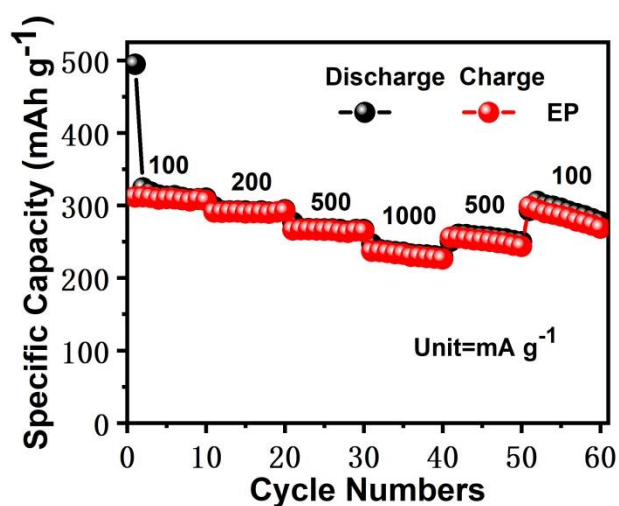


Fig. S6 Rate performance of FeSe₂-RGO electrode using EP-based electrolyte

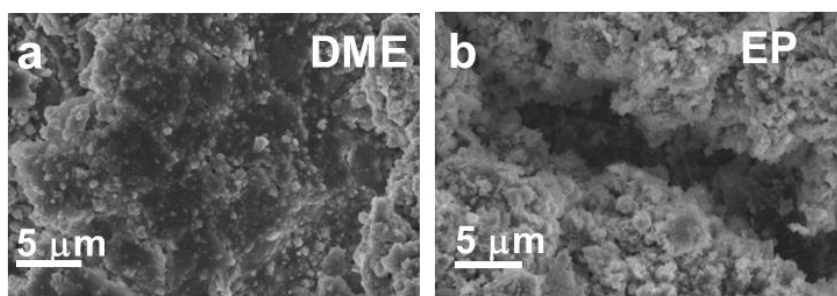


Fig. S7 SEM images of electrode in (a) DME-based and (b) EP-based electrolytes after cycles

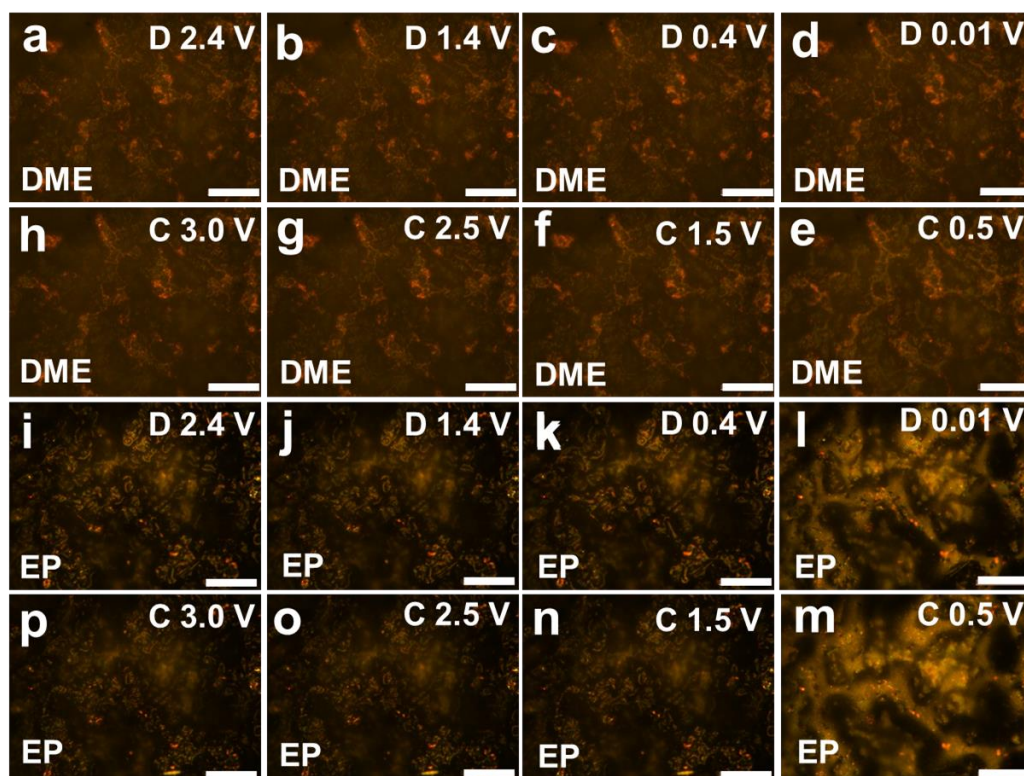


Fig. S8 In situ visualization: (a-h) different potassiation-depotassiation states of FeSe₂@RGO electrode using DME-based electrolyte in the second cycle; (i-p) different potassiation-depotassiation states of FeSe₂@RGO electrode using EP-based electrolyte in the second cycle. The scale bar in each image is 50 μm.

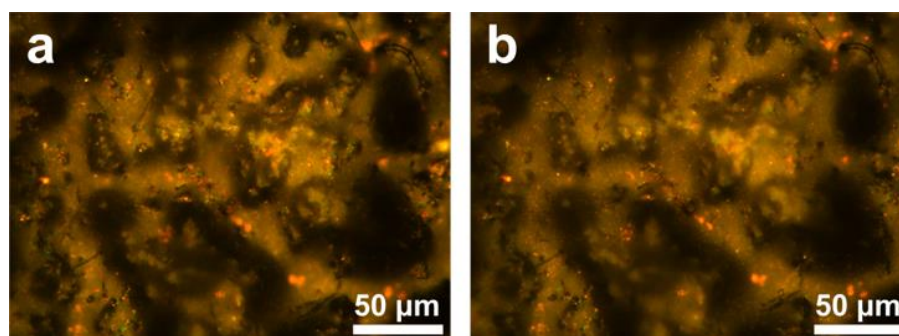


Fig. S9 In situ visualization of FeSe₂@RGO electrode using EP-based electrolyte: (a) charging to 0.38 V in the first cycle; (b) charging to 0.12 V in the second cycle. It is found that huge morphological change in this state, indicating the appearance of inhomogeneous expansion.



Fig. S10 Photograph of the practical in-situ Raman spectra testing system

Video S1 In-situ visualization of FeSe₂@RGO electrode using DME-based electrolyte in initial two cycles.

Video S2 In-situ visualization of FeSe₂@RGO electrode using EP-based electrolyte in initial two cycles.