Electronic Supplementary Material (ESI) for Materials Advances.

Supporting Information

Stable Cycling via Absolute Intercalation in Graphite-Based Lithium-Ion Battery Incorporated by Solidified Ether-Based Polymer Electrolyte

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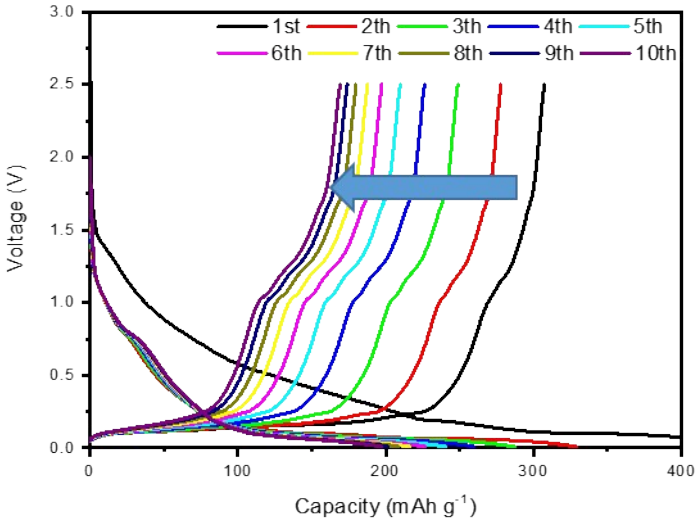

Fig. S1. Potential profile of the lithium/graphite half-cell with BisA-PEGDME polymer electrolyte for ten cycles.

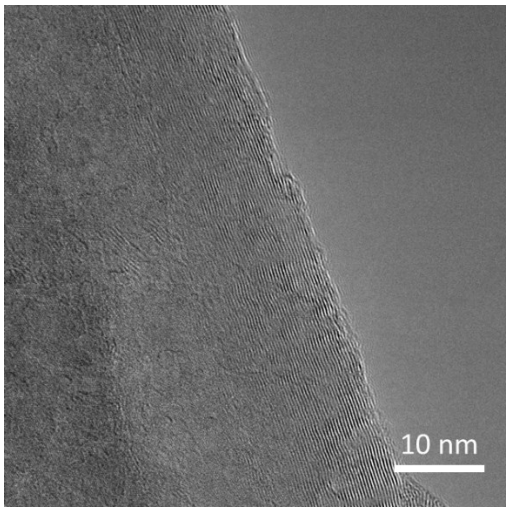

Fig. S2. TEM image of pristine graphite.

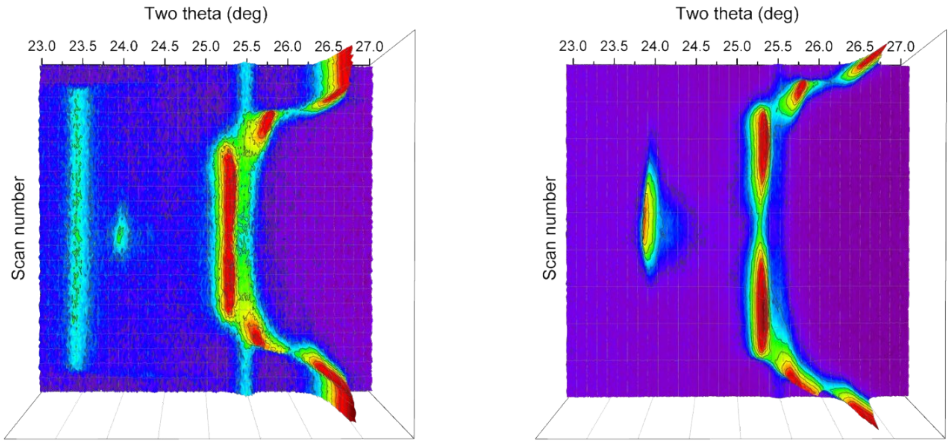

Fig. S3. In-situ XRD patterns of lithium/graphite half-cell containing PEGDME electrolyte without (left) and with (right) FEC.

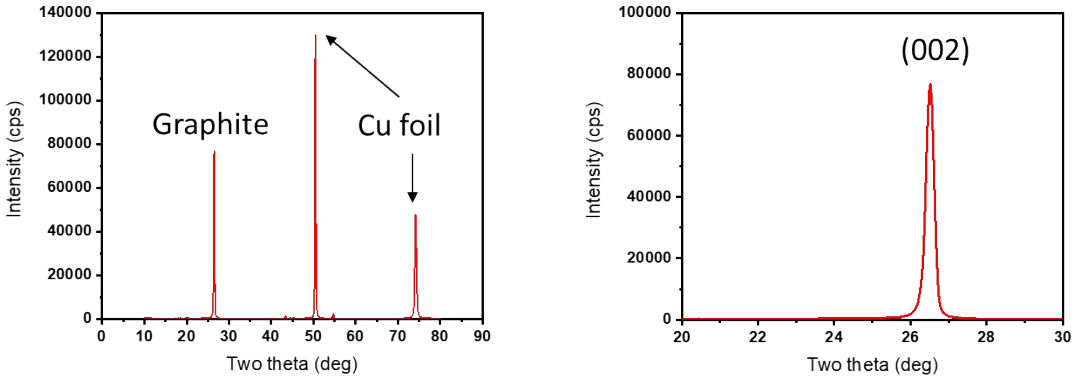

Fig. S4. Ex-situ XRD patterns of graphite electrode on copper foil. A mixture of graphite, PVdF, and super P was prepared in a weight ratio of 8:1:1, and then it was coated on a copper foil to make the graphite electrode. The peak at 26.5° is originated from (002) plane of the graphite, whereas the peaks at approximately 50° and 75° are attributed to the copper foil.

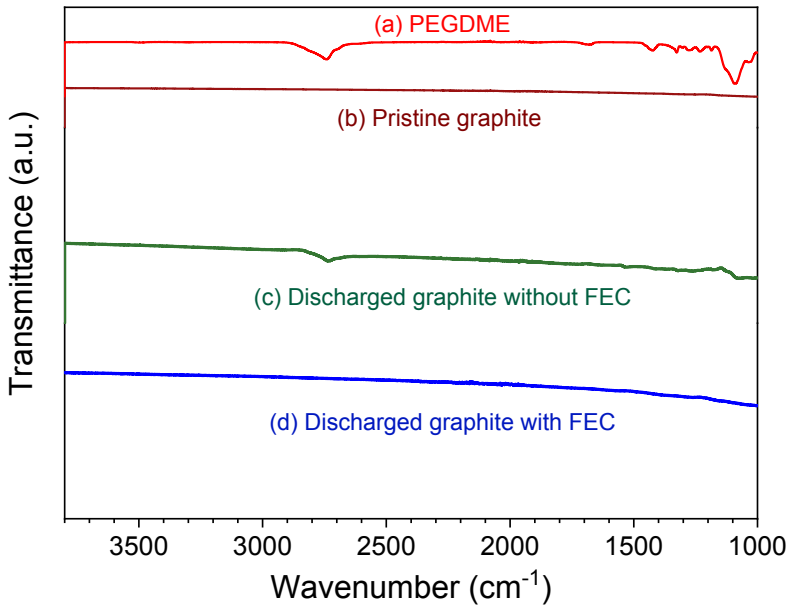

Fig. S5. IR spectra of (a) PEGDME, (b) pristine graphite, (c) discharged graphite without FEC, and (d) discharged graphite with FEC. For the IR spectra of graphite powder at discharge state, Li/PEGDME/Graphite half cells with or without FEC were prepared. The cells were discharged at 0.1 C and then the cells were disassembled in the glove box. The graphite powders were washed several times with dimethoxyethane. After the powders were dried in the vacuum oven, the graphite powders were observed by IR.

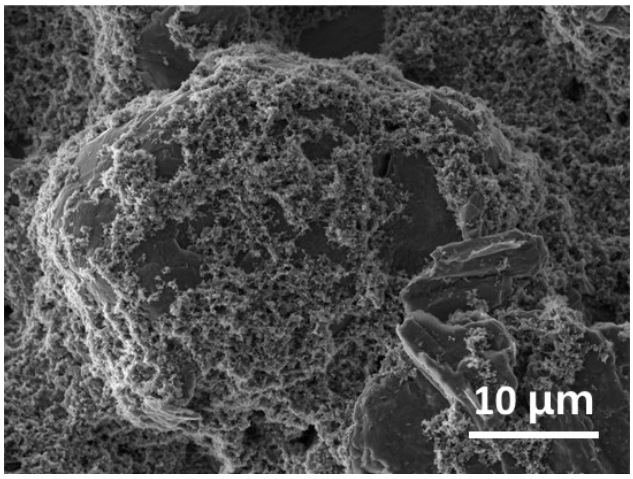

Fig. S6. SEM image of pristine graphite electrode. The graphite electrode was prepared by mixing graphite, PVdF, and super P as a weight ratio of 8:1:1.

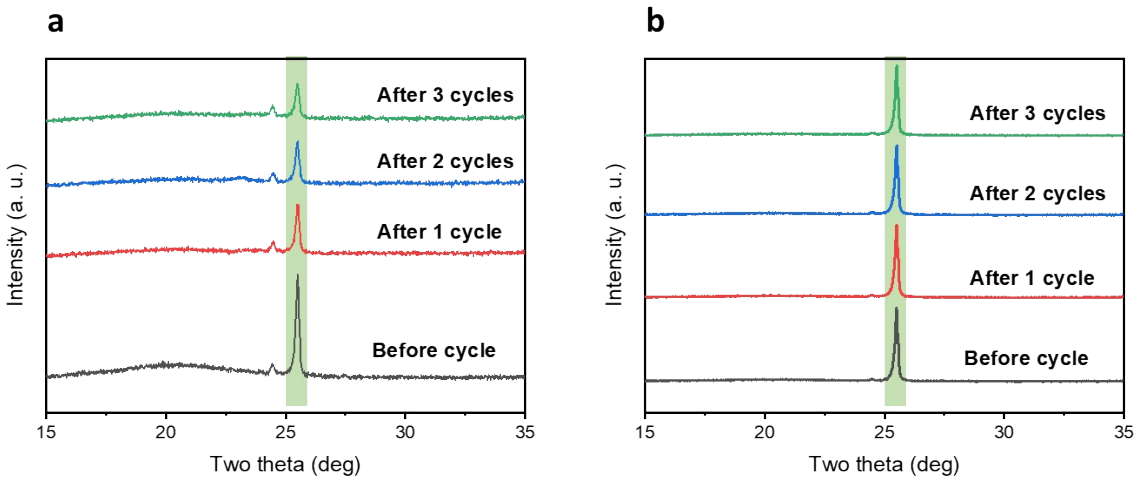

Fig. S7. In-situ XRD patterns of the lithium/graphite half-cell containing PEGDME electrolyte (a) without and (b) with FEC.

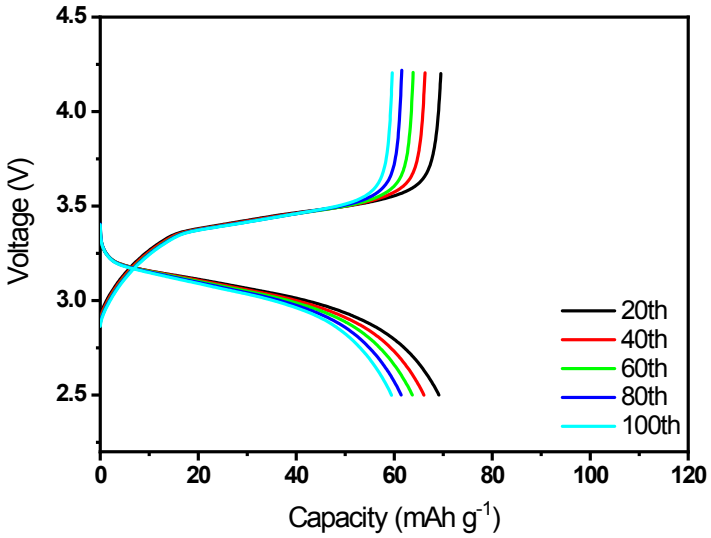

Fig. S8. Charge-discharge profiles of the graphite/$LiFePO_4$ full-cell with the BisA-PEGDME polymer electrolyte and FEC for 100 cycles.

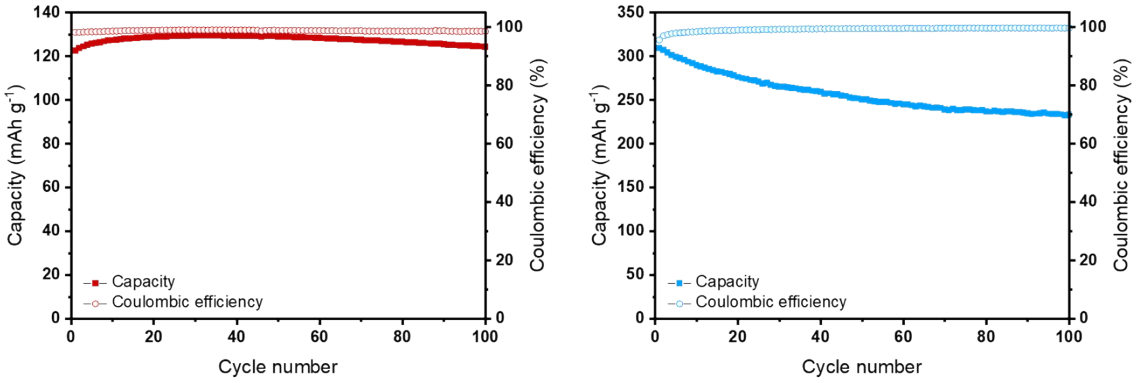

Fig. S9. The change of capacity in Li/$LiFePO_4$ (left) and Li/graphite (right) half-cell with the BisA-PEGDME polymer electrolyte and FEC for 100 cycles