Supplemental Information

High energy electron beam irradiation on the electrolyte enables fast-charging of lithium metal battery with long-term cycling stability

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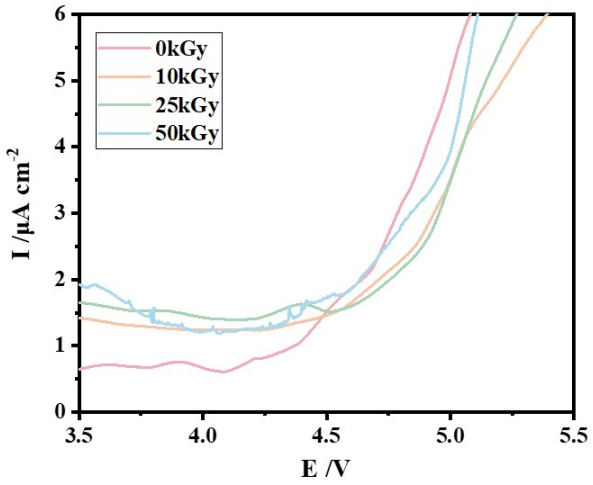

Figure S1. Linear sweep voltammetry curves of Al||Li Cells in electrolyte with different irradiation doses.

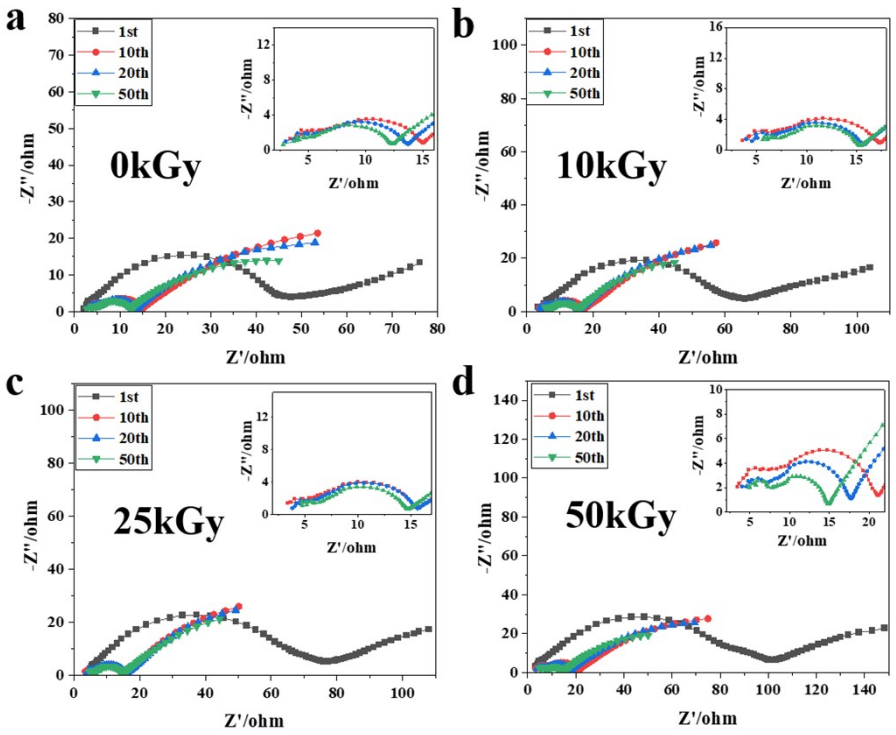

Figure S2. Electrochemical impedance of Li||Li Symmetric Cells in electrolyte with different irradiation doses at 30 °C.

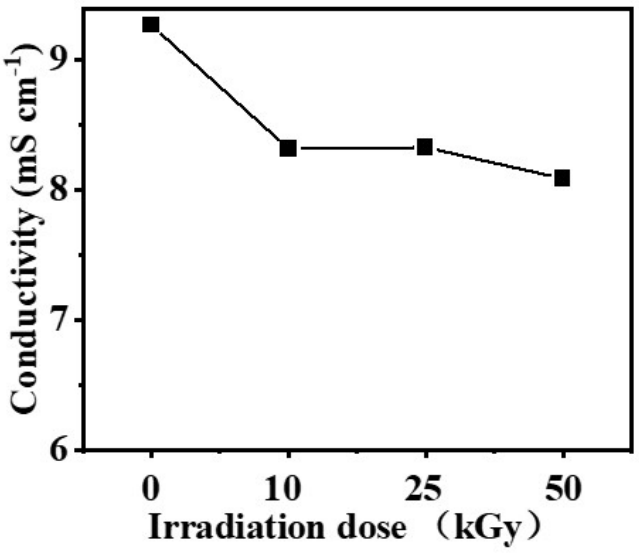

Figure S3. Ionic conductivity of Li||Li Symmetric Cells in electrolyte with different irradiation doses at 30 °C.

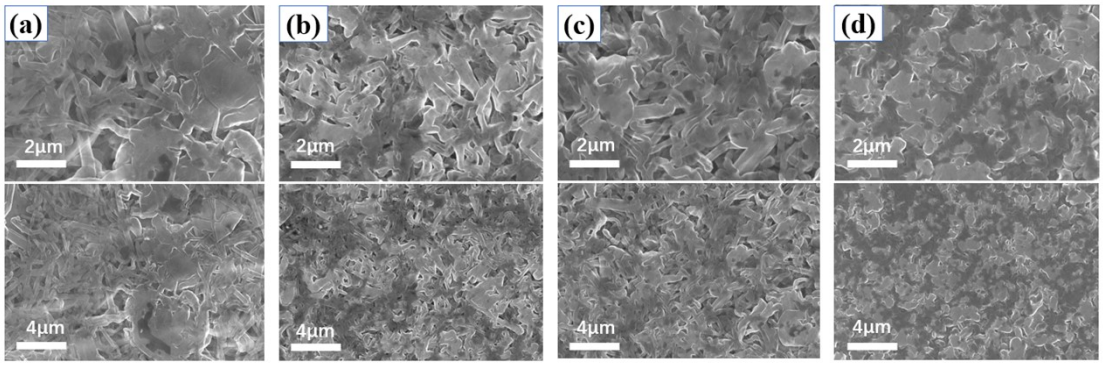

Figure S4. a-d) SEM images of the first lithium deposition at 4mA cm^{-2} with 1 mAh cm^{-2} on Cu foil in 0, 10, 25, 50 kGy electrolyte.

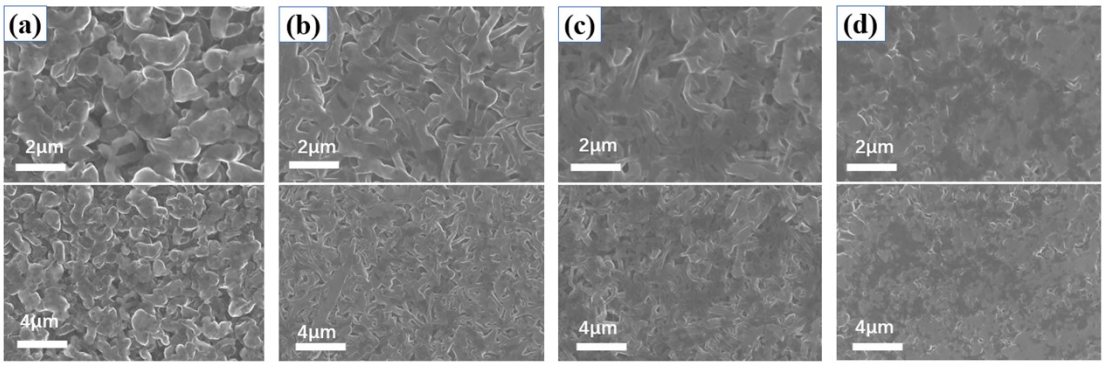

Figure S5. a-d) SEM images of the first lithium deposition at 6mA cm^{-2} with 1 mAh cm^{-2} on Cu foil in 0, 10, 25, 50 kGy electrolyte.

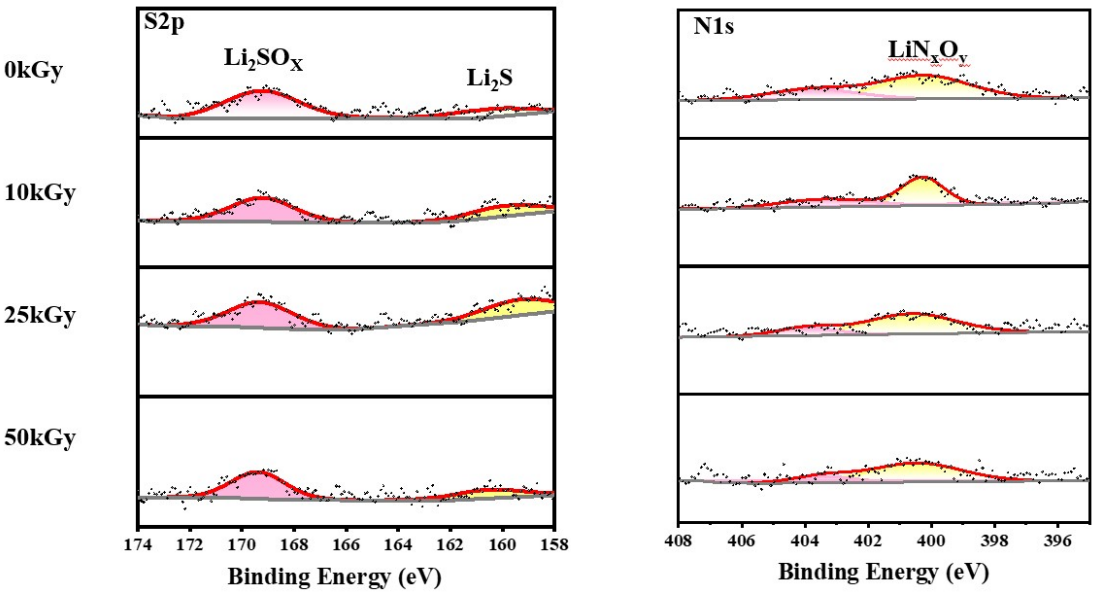

Figure S6. XPS spectra of S2p and N1s on NCM_{91} cathode after 400 cycles at 4 C rate with different electrolyte.