Highly effective solid electrolyte interphase (SEI)-forming electrolyte additive enabling high voltage lithium ion batteries

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Supporting Figures

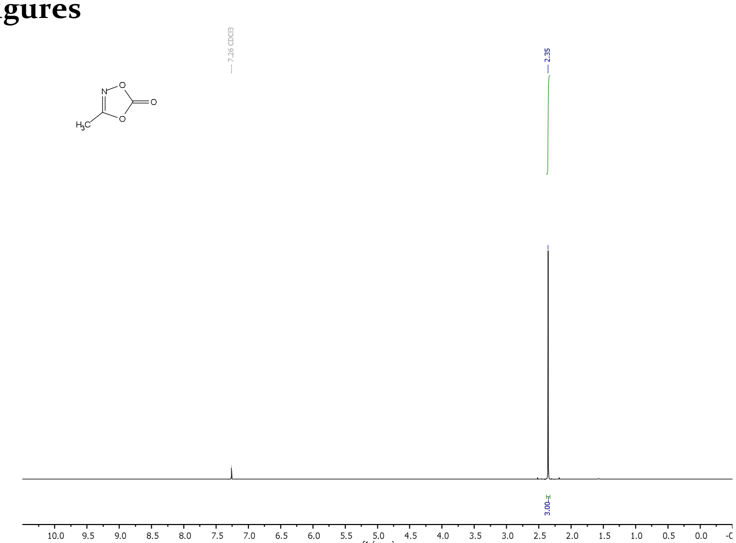

Figure S1. ^{1}H-NMR spectrum of MDO in chloroform-*d* solvent at T = 300 K.

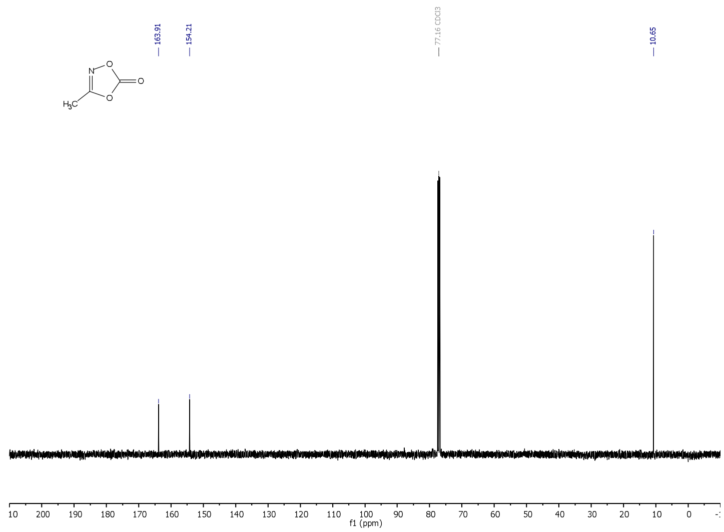

Figure S2. ^{13}C-NMR spectrum of MDO in chloroform-*d* solvent at T = 300 K.

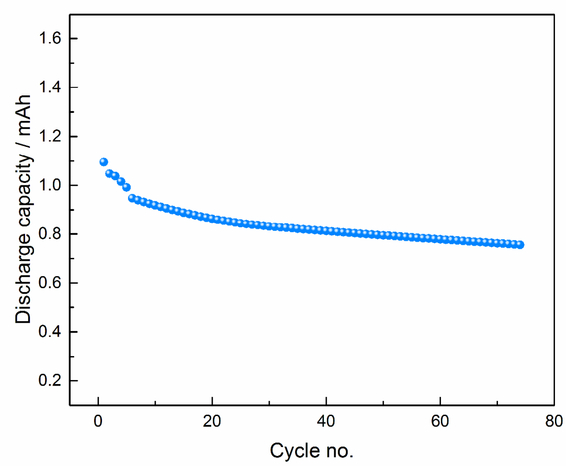

Figure S3. Long-term cycling stability of NMC532/graphite full cells comprising 1 M $LiPF_6$ in PC +2 wt.% MDO at 60 °C. Cells were cycled in the voltage range from 2.8 V to 4.2 V.

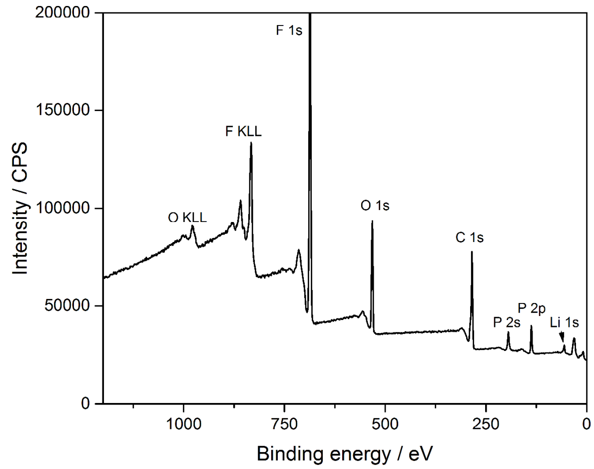

Figure S4. XPS survey spectrum of harvested graphite electrode after first charge/discharge in NMC532/graphite full cells using 1 M $LiPF_6$ in PC + 2 wt.% FEC electrolyte formulation. Instead of a pass energy of 40 eV, a pass energy of 160 eV were used for survey spectra.

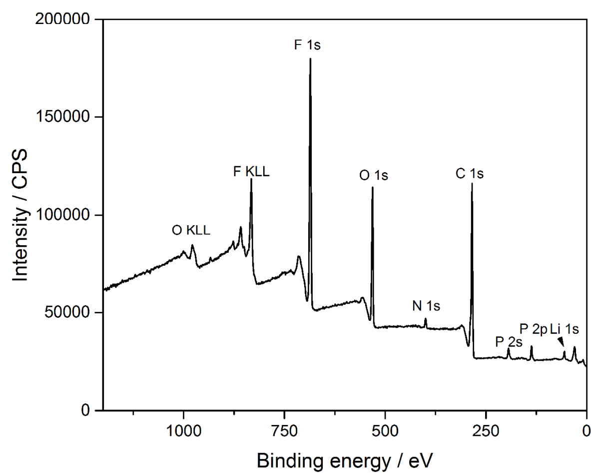

Figure S5. XPS survey spectrum of harvested graphite electrode after first charge/discharge in NMC532/graphite full cells using 1 M $LiPF_6$ in PC + 2 wt.% MDO electrolyte formulation. Instead of a pass energy of 40 eV, a pass energy of 160 eV were used for survey spectra.

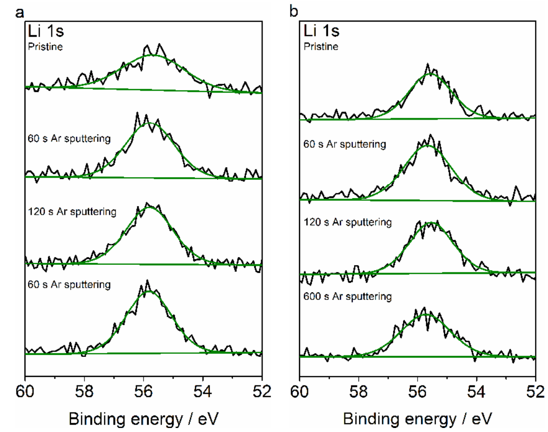

Figure S6. Li 1s XPS depth profiling spectra of harvested graphite electrodes after first charge/discharge in NMC532/graphite full cells using (a) 1 M $LiPF_6$ in PC + 2 wt.% FEC and (b) 1 M $LiPF_6$ in PC + 2 wt.% MDO electrolyte formulation.

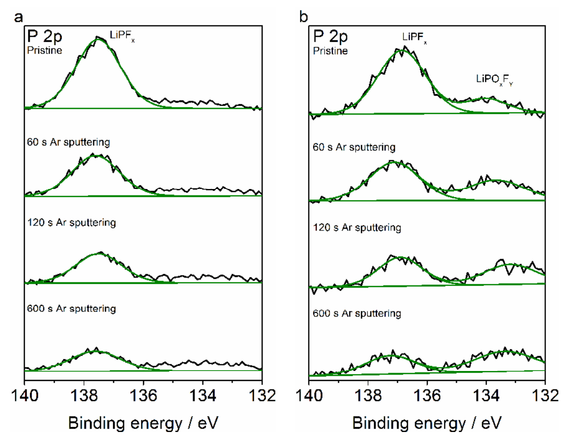

Figure S7. P 2p XPS depth profiling spectra of harvested graphite electrodes after first charge/discharge in NMC532/graphite full cells using (a) 1 M $LiPF_6$ in PC + 2 wt.% FEC and (b) 1 M $LiPF_6$ in PC + 2 wt.% MDO electrolyte formulation.

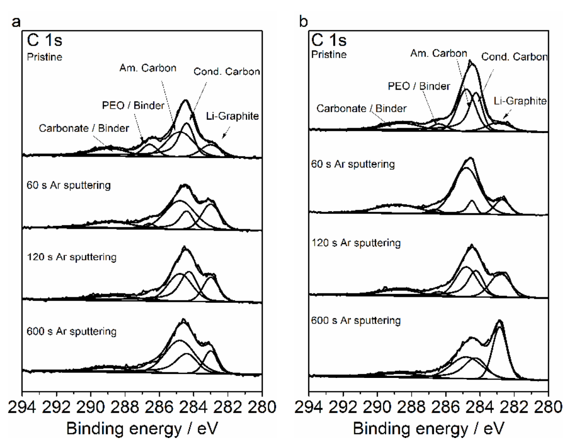

Figure S8. C 1s XPS depth profiling spectra of harvested graphite electrodes after first charge/discharge in NMC532/graphite full cells using (a) 1 M $LiPF_6$ in PC + 2 wt.% FEC and (b) 1 M $LiPF_6$ in PC + 2 wt.% MDO electrolyte formulation.

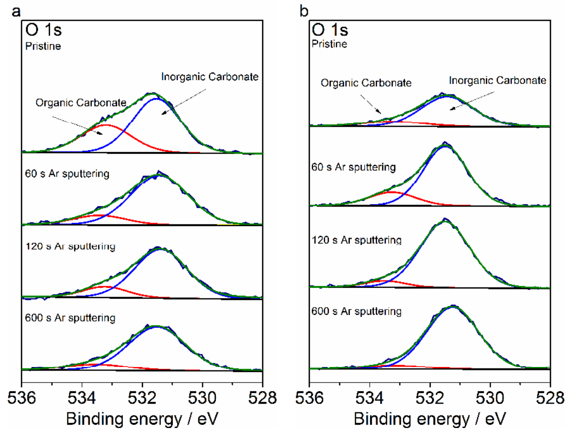

Figure S9. O 1s XPS depth profiling spectra of harvested graphite electrodes after first charge/discharge in NMC532/graphite full cells using (a) 1 M $LiPF_6$ in PC + 2 wt.% FEC and (b) 1 M $LiPF_6$ in PC + 2 wt.% MDO electrolyte formulation.

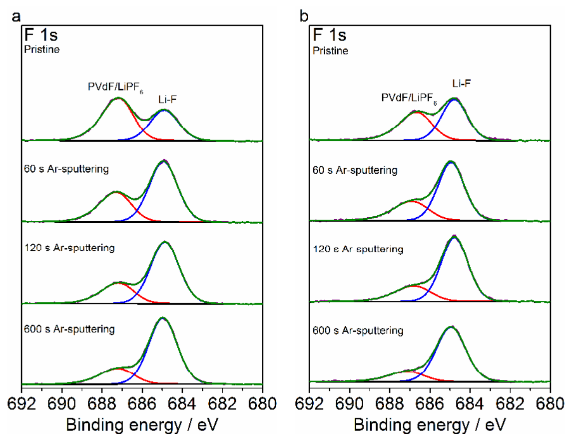

Figure S10. F 1s XPS depth profiling spectra of harvested graphite electrodes after first charge/discharge in NMC532/graphite full cells using (a) 1 M $LiPF_6$ in PC + 2 wt.% FEC and (b) 1 M $LiPF_6$ in PC + 2 wt.% MDO electrolyte formulation.