Supporting Information

Le Chatelier's principle enables stable and sustainable aqueous sodium/magnesium-ion batteries

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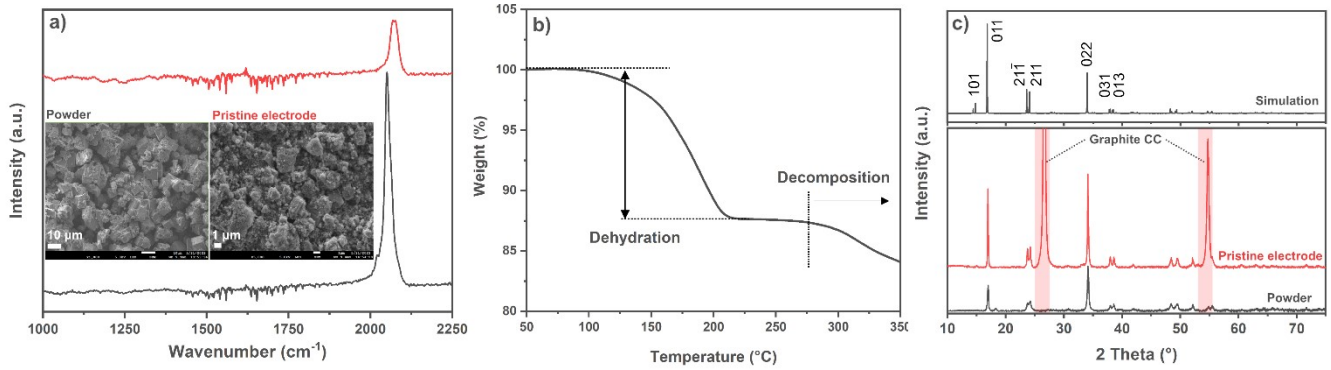

Figure S1. a) FTIR spectra with an ambient air correction, SEM images, and c) background subtracted XRD pattern of the Mn-PBA powder and pristine electrode. b) Thermogravimetric curve of Mn-PBA. The simulated XRD pattern in c) was generated using the reported crystal structure.[1]

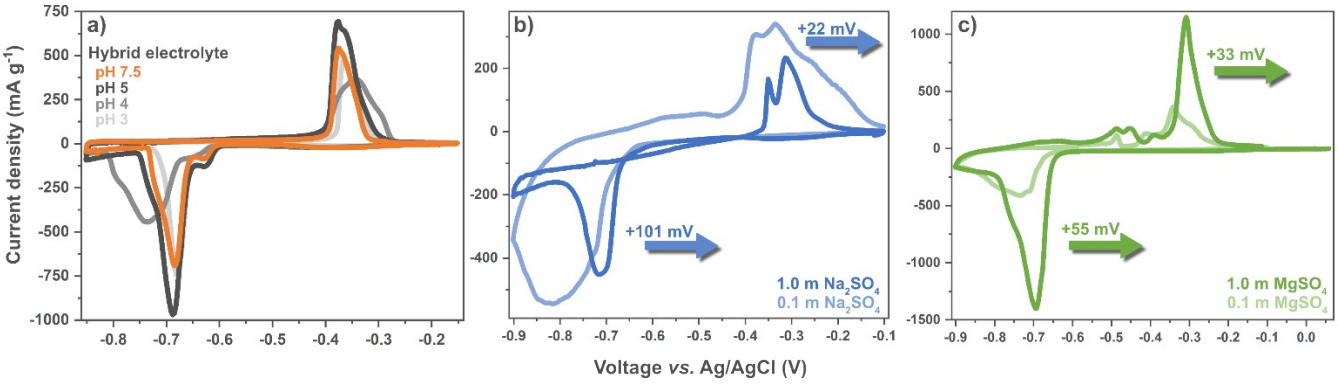

Figure S2. PTCDA electrode voltammograms (cycle 1, 0.2 mV s^{-1}) at different a) pH, b) [Na^+], and c) [Mg^{2+}].

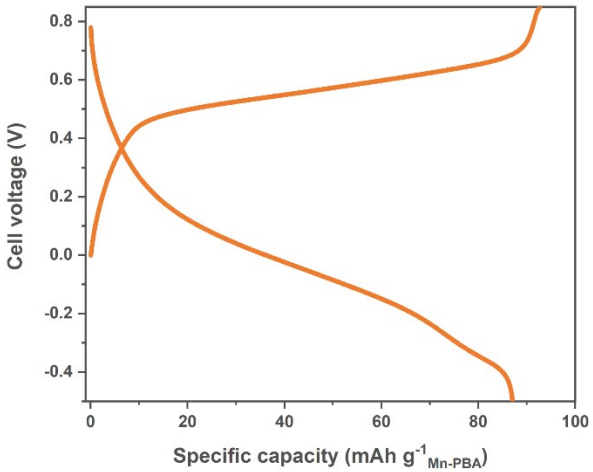

Figure S3. Typical charge/discharge curves for the ex situ *characterizations.*

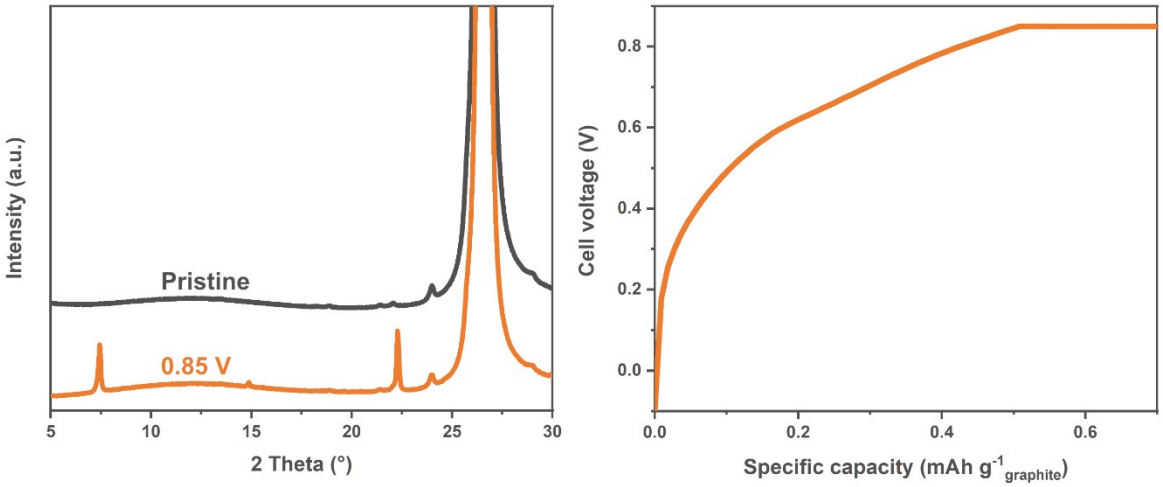

Figure S4. X-ray diffractograms of pristine and oxidized graphite current collectors (left) and the corresponding voltage profile (right).

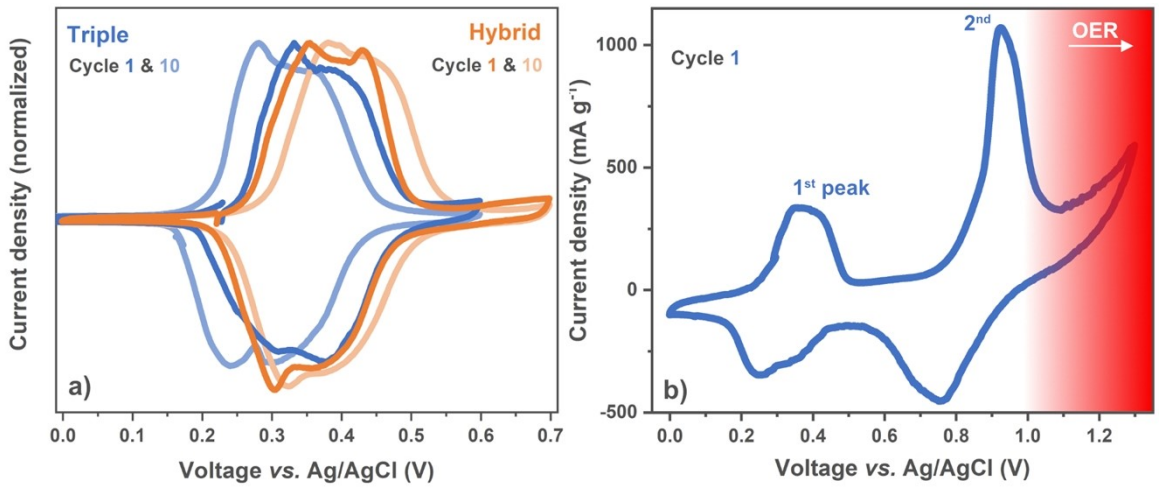

Figure S5. Mn-PBA electrode voltammograms at 0.2 mV s^{-1}.

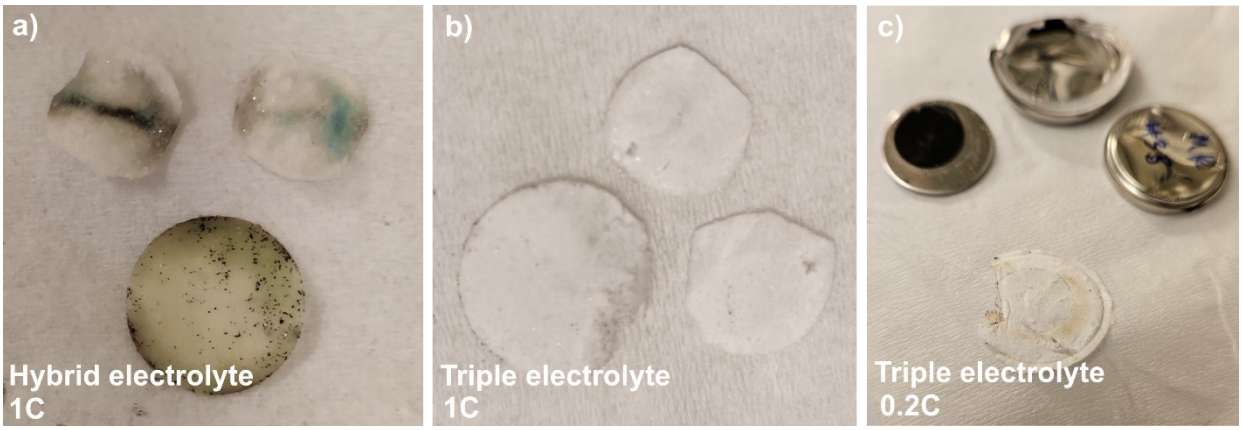

Figure S6. a-b) Separators from Mn-PBA half-cells after 200 galvanostatic cycles at 1C. The smaller, cut separators were barriers to the RE and the black 'spots' originates from the AC CE. c) The disassembled cell from the 0.2C long-term cycling stability test (right inset Figure 3c).

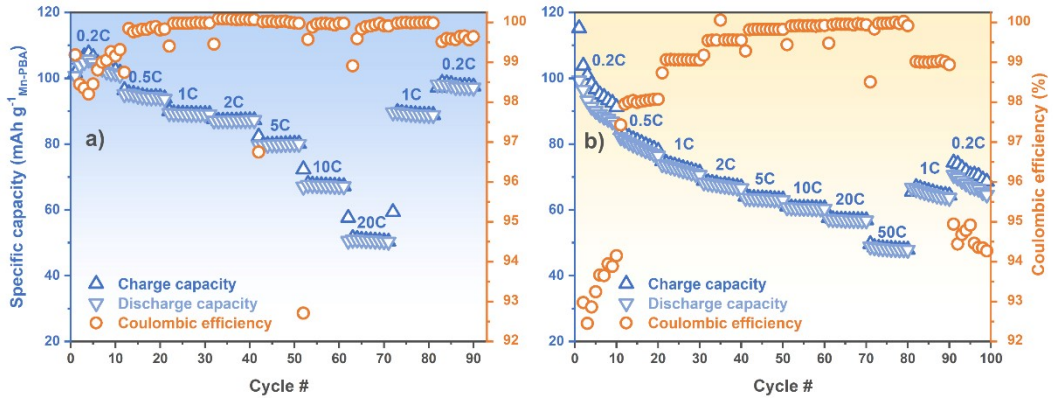

Figure S7. a) Mn-PBA half-cell and b) PTCDA|Mn-PBA rate capability tests with the triple electrolyte.

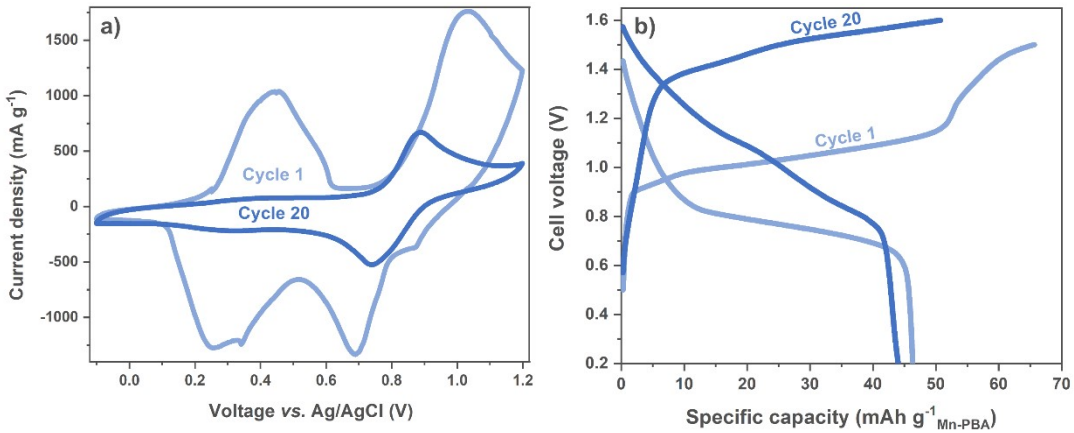

Figure S8. a) Mn-PBA electrode voltammogram at 0.2 mV s^{-1} and b) PTCDA|Mn-PBA charge/discharge curves after 20 cycles at 1C with a high cut-off voltage with the triple electrolyte.

References:

1. M. Oliver-Tolentino, M. G. M, H. Osiry, G. Ramos-Sánchez and I. González, *Dalton Trans.*, 2018, **47**, 16492–16501.