Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting information

Elucidating the Energy Storage Mechanism of $ZnMn_2O_4$ as Promising Anode for Li-Ion Batteries

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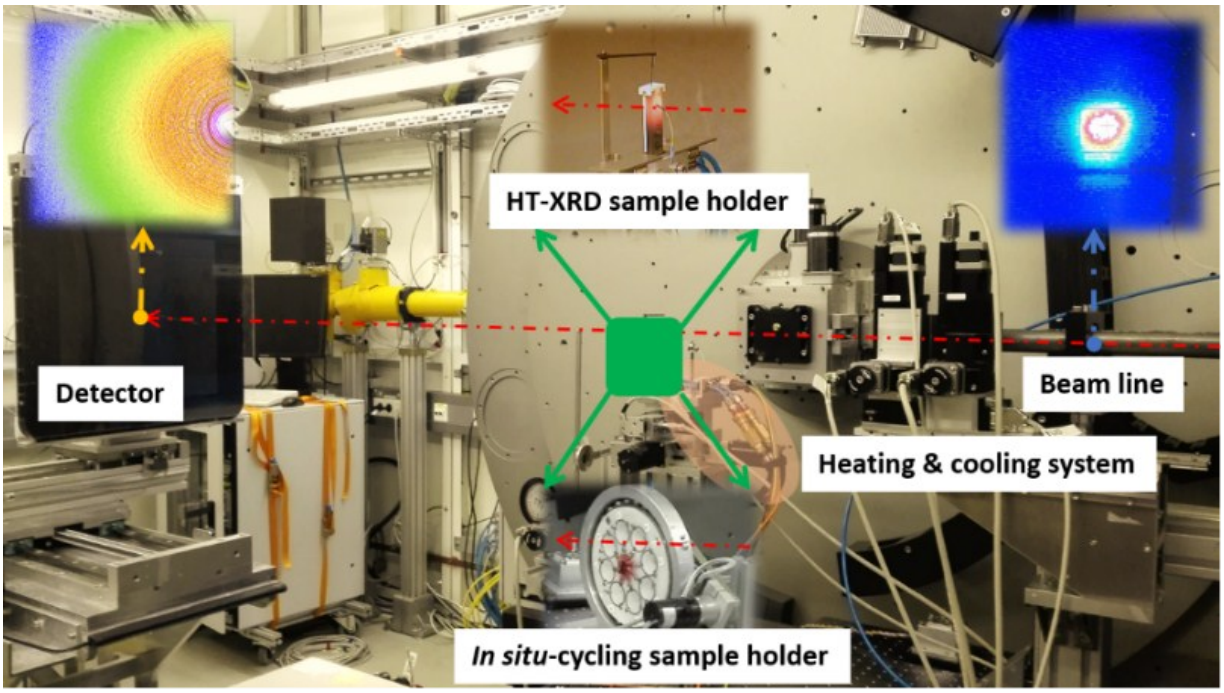

Fig. S1 Overview of the HT-SXRD and *in situ* SXRD instruments in the P02.1, Petra-III DESY, Hamburg.

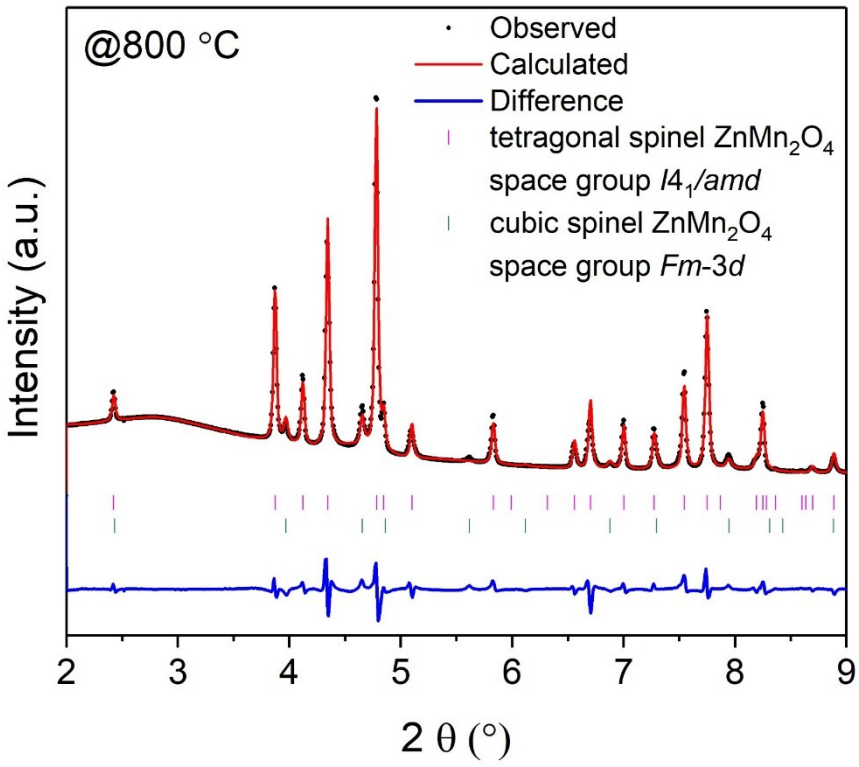

Fig. S2 The SXRD pattern of the scan at 800 °C in HT-SXRD and the Rietveld refinement result.

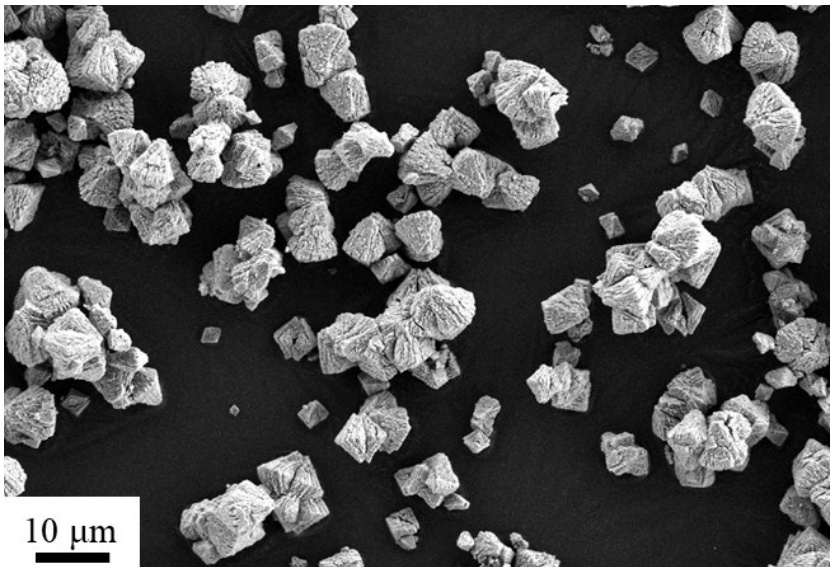

Fig. S3 FESEM image of the cp-ZMO-500 at low magnification.

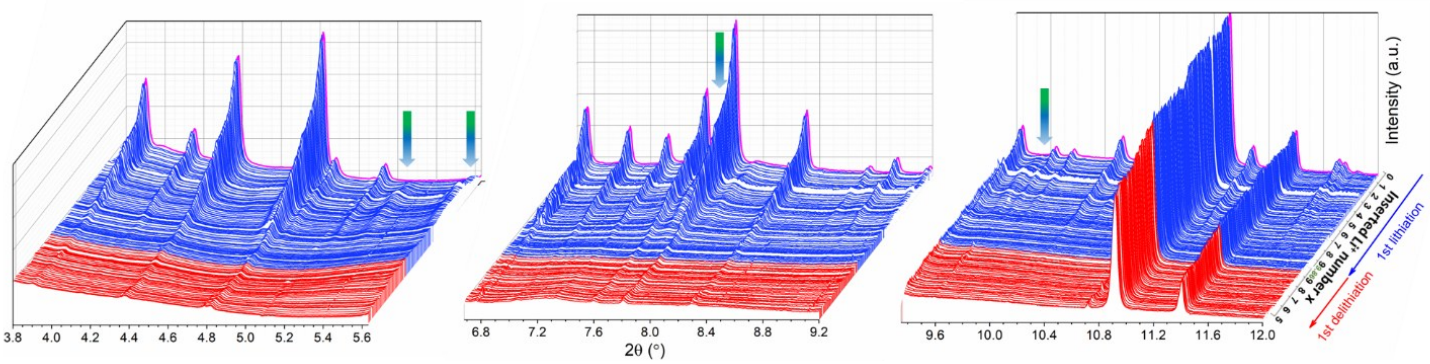

Fig. S4 *In situ* SXRD patterns of the $ZnMn_2O_4$ half-cell during the 1st cycle at a current density of 70 mA g^{-1}, referring to the lithiation process (blue) and delithiation process (red);

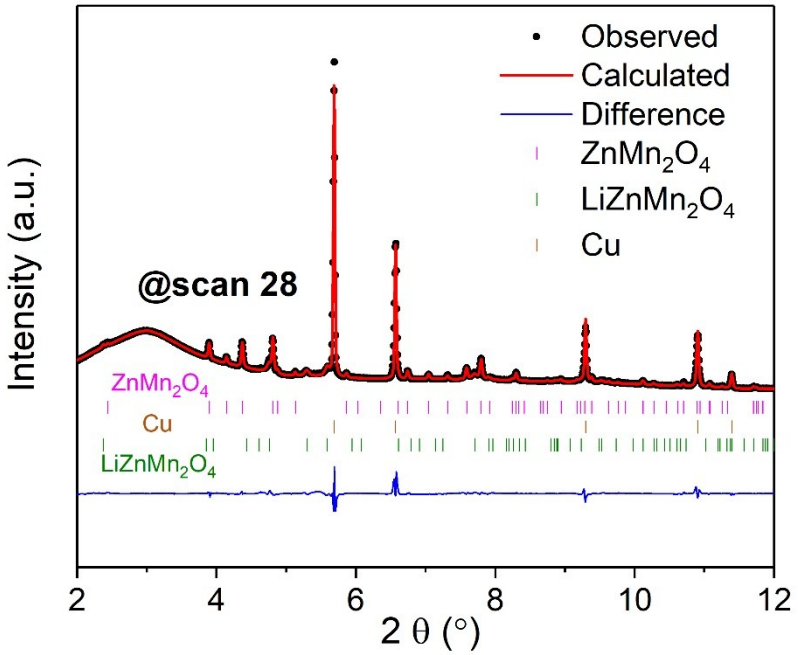

Fig. S5 *In situ* SXRD pattern of scan 28 and the Rietveld refinement result.

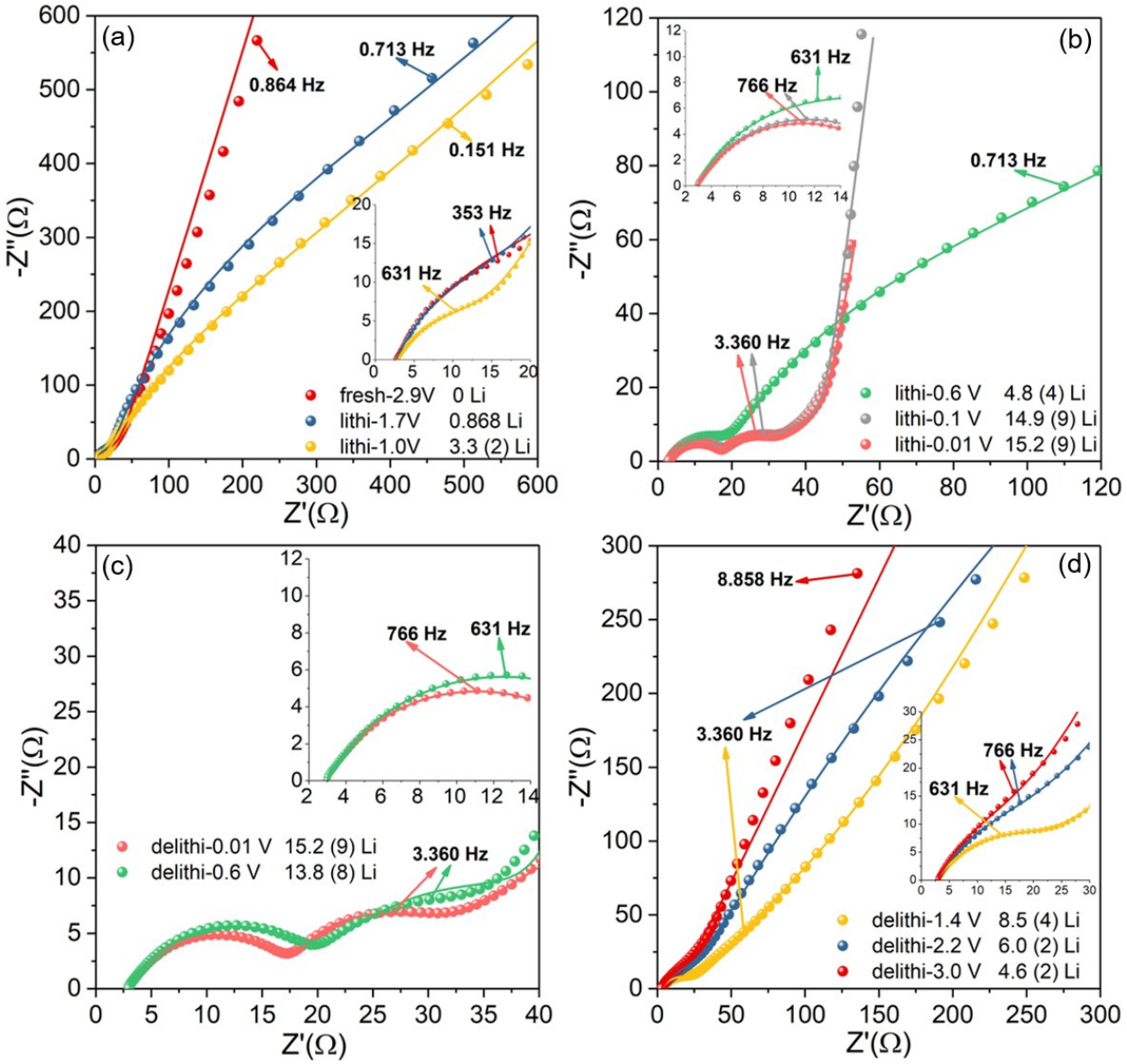

Fig. S6 EIS Nyquist plots (points) and the fitting curves (solid line) of the 1st cycle of the $ZnMn_2O_4$ half-cell.

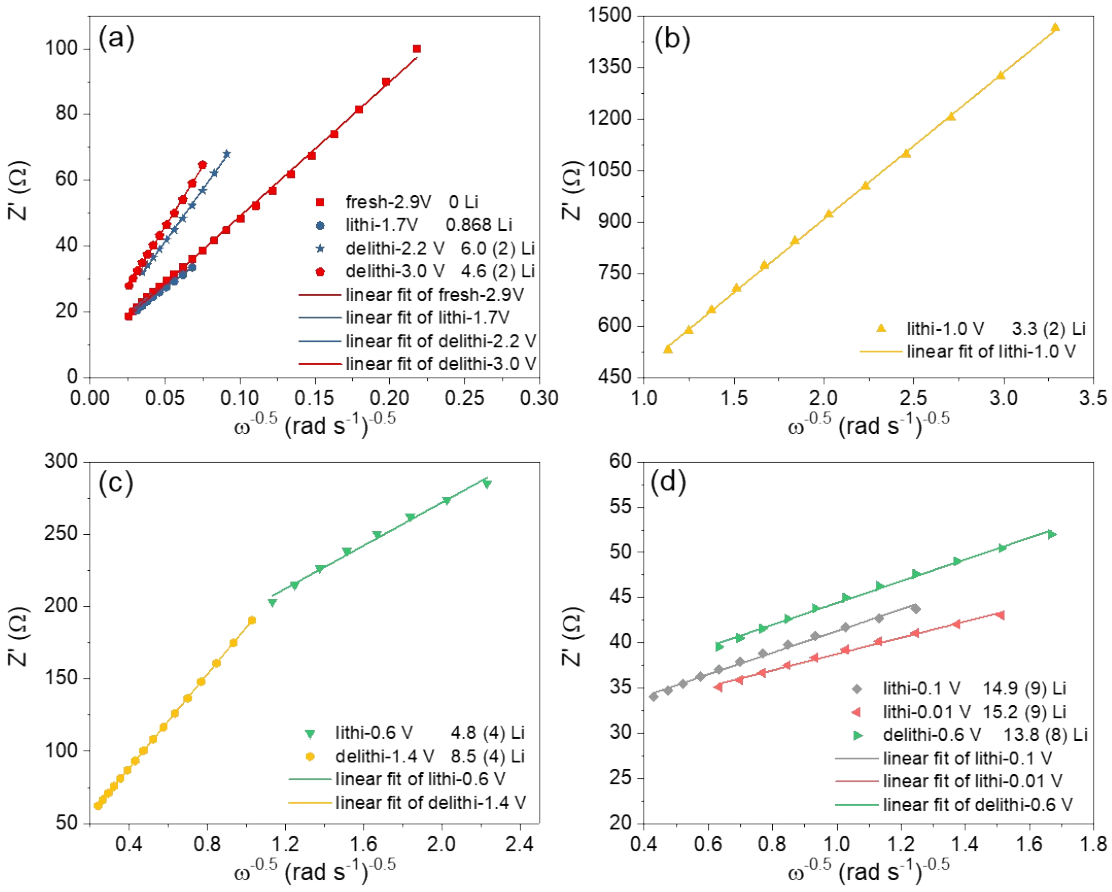

Fig. S7 The linear relationship between the Z' and the $\omega^{-0.5}$ according to the EIS plots scanned at different (de)lithiation states.

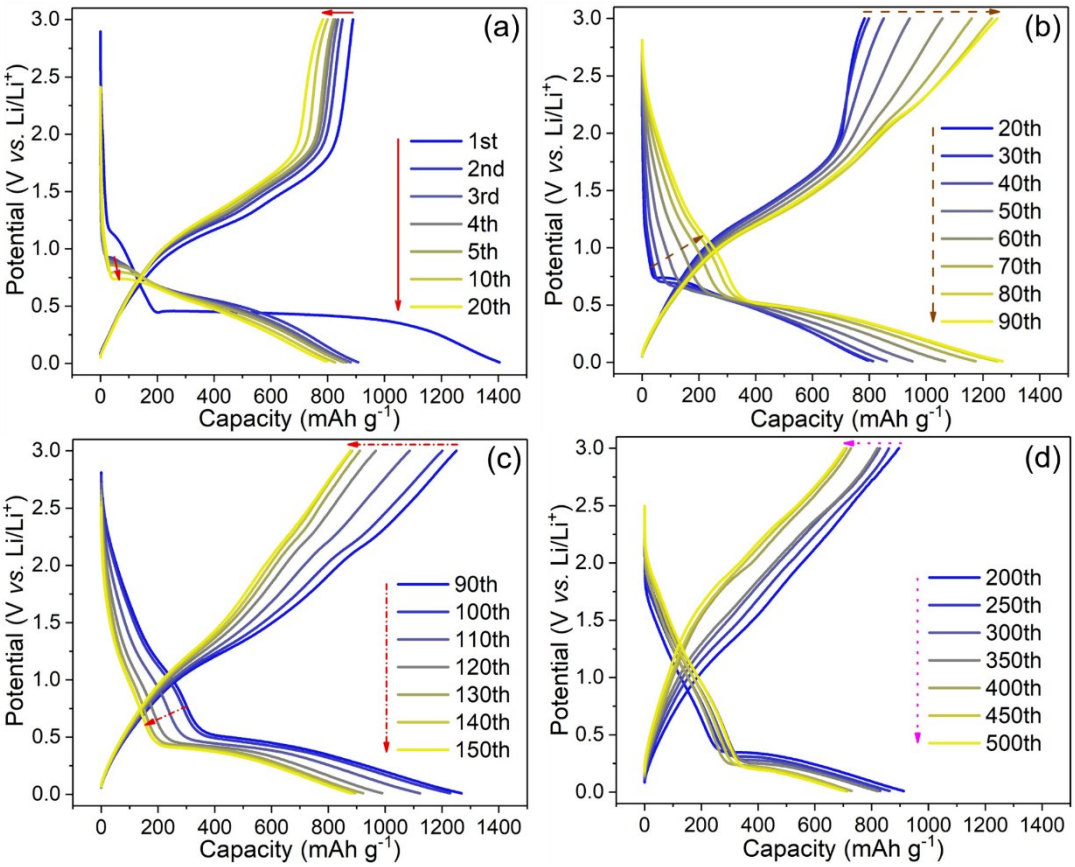

Fig. S8 The selected potential profiles of the long-term cycling at 0.5 A g^{-1} of the $ZnMn_2O_4$ anode.

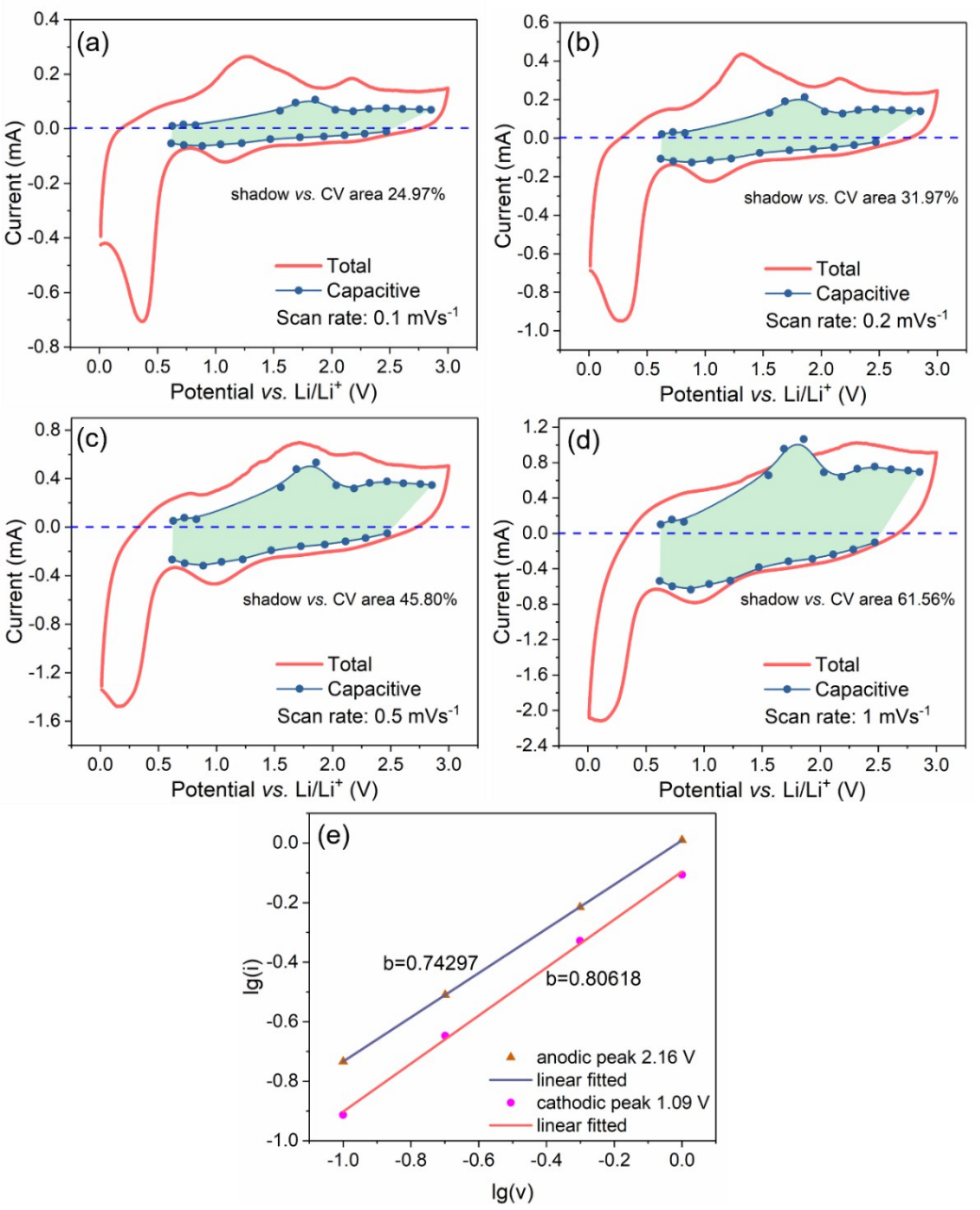

Fig. S9 (a-d) The CV curves of the $ZnMn_2O_4$ half-cell (after 55 cycles) scanned at varied rates 0.1~1 mV s^{-1} with fitted capacitive contribution (shadow area) and (e) linear fitting of the lg(*i*) *vs*. lg(*v*) plots.