Supporting Information

Robust and durable Li-ion batteries fabricated by using lead-free crystalline M_2NiMnO_6 (where M= Eu, Gd, Tb) double perovskites

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Keywords: Li-ion battery; anode electrode; double perovskite; electrochemical properties, energy storage

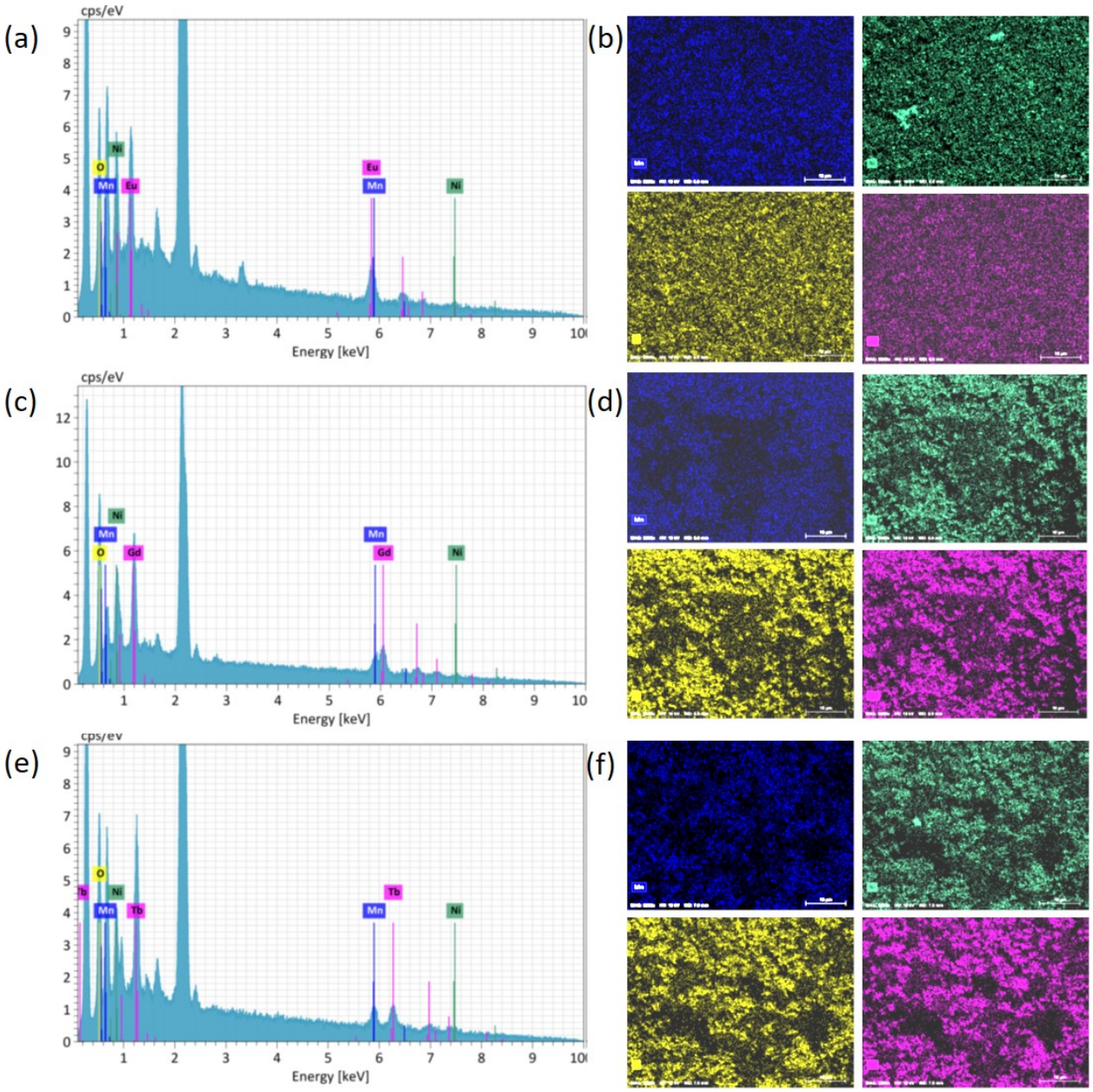

Figure S1. EDAX and elemental mapping analysis of the double perovskite M_2NiMnO_6 (where M= Eu, Gd, Tb) anode electrodes, **(a, b)** Eu_2NiMnO_6 **(c, d)** Gd_2NiMnO_6 **(e, f)** Tb_2NiMnO_6.

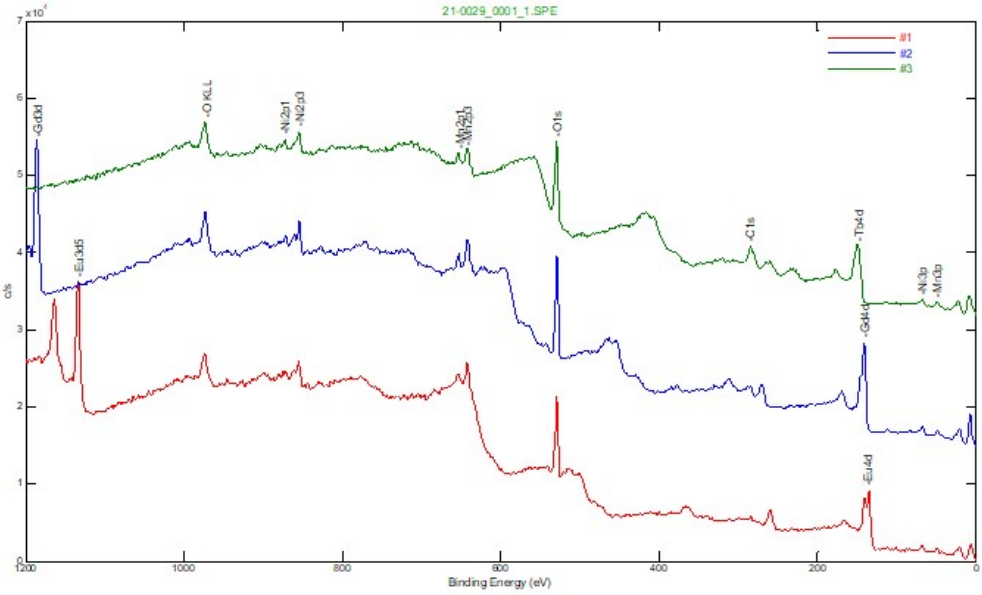

Figure S2. X-ray photo electron spectroscopy (XPS) survey spectra of the double perovskite M_2NiMnO_6 (where M= Eu, Gd, Tb), revealing the presence of the all the desired elements.

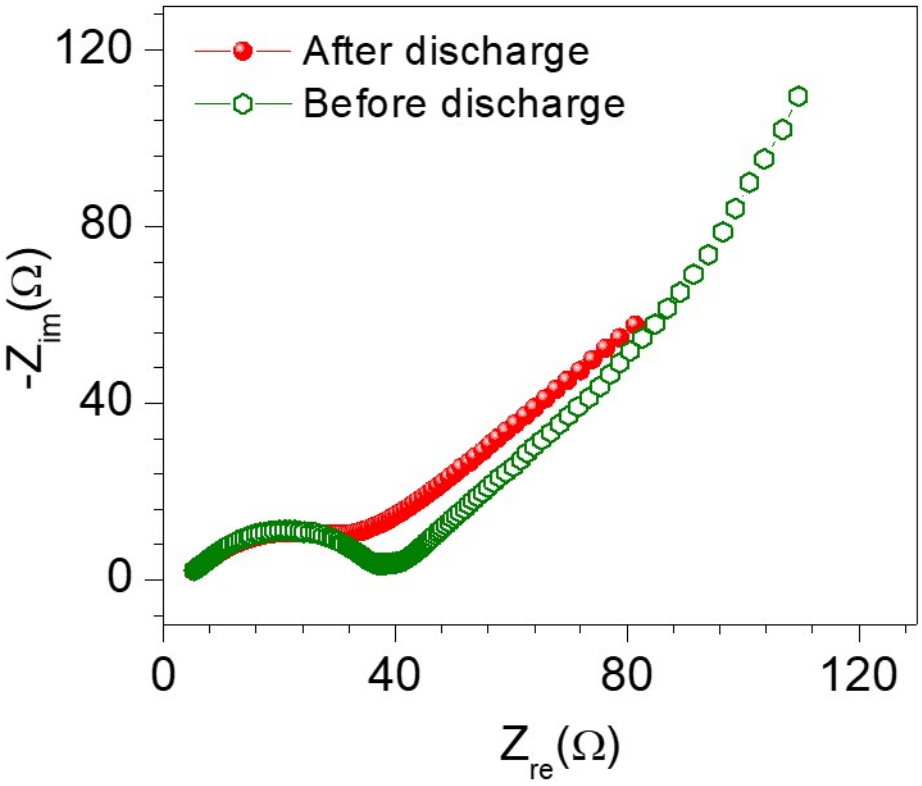

Figure S3. Nyquist plots of the Tb_2NiMnO_6 anode electrode before and after lithiation process, suggesting the significant reduction of the charge transfer resistance upon lithiation.

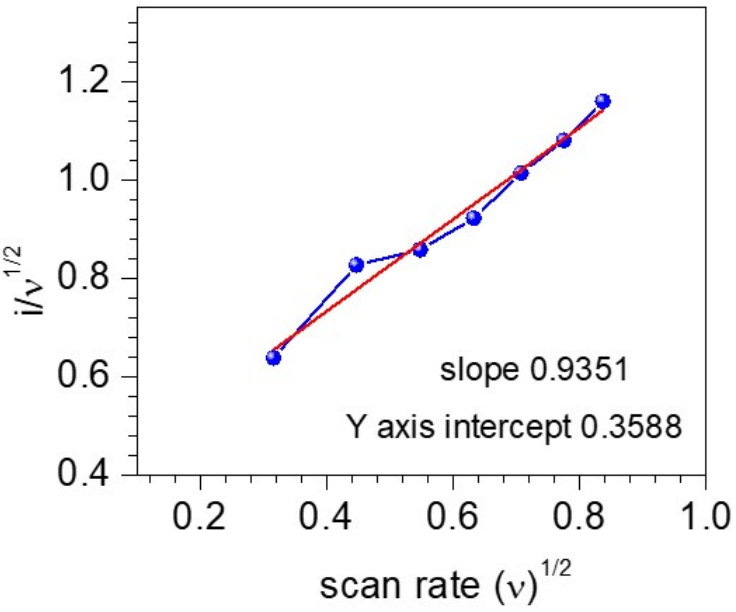

Figure S4. The plot of the $v^{1/2}$ vs. $i/v^{1/2}$ is potted to estimate the k_1 and k_2 which are the slope of the curve and the y-axis intercept, respectively

Table-1 Parameters obtained by fitting of Nyquist plot using Zfit software as a function of potential.

Sr. No.	Sample Name	Solution resistance (*Rs*-Ω)	Charge-transferer resistance (*Rct*- Ω)	Warburg impedance (W-Ω.$s^{-1/2}$)
1.	Gd_2NiMnO_6	22.0	68.5	22
2.	Tb_2NiMnO_6	5.2	31.5	8.5