Synergic effect of Nanostructuring and Excess Mn3+ Content in the Electrochemical Performance of Li4Ti5O12 –LiNi0.5Mn1.5O4 Li-Ion Full-cells

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**Supporting Information**



**Figure S1:** A representation of various full cell combinations of Li ion electrodes as a function of increase in potential with respect to Li. Full cell combining a low voltage anode and high voltage cathode provides high cell voltage which is directly related to the energy density of a battery.



**Figure S2:** XRD and Raman studies of LTO and LNMO (a) XRD patterns of LTOd and LTOc, (b) and (c) Rietveld refined XRD patterns of LNMOp and LNMOcplr, (d) A comparative Raman spectra of LNMOp and LNMOcplr.

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**Figure S3.** 200 cycle GCD voltage profiles of FCs at 1C rate. a) LTOc–LNMOp b) LTOc–LNMOcplr c) LTOd–LNMOp d) LTOd–LNMOcplr

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**Figure S4.** EIS **e**quivalent circuit for LTOc–LNMOp FC

**Table S1:** A summary of full cell EIS studies

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| --- | --- | --- | --- | --- |
| Full-Cells | Re (Ω) | Rsl (Ω) | Rct (Ω) | Rw (Ω) |
| LTOc –LNMOp | 4.34 | 545.4 | 15007 | - |
| LTOc –LNMOcplr | 4.62 | 57.57 | 135.26 | 136.03 |
| LTOd –LNMOp | 4.06 | 39.50 | 90.02 | 316.60 |
| LTOd –LNMOcplr | 4.12 | 30.31 | 79.13 | 245.52 |