Electronic Supplementary Material (ESI) for Sustainable Energy & Fuels.

Supporting Information

Green electrode processing using seaweed-derived mesoporous carbon additive and binder for $LiMn_2O_4$ and $LiNi_{1/3}Mn_{1/3}Co_{1/3}O_2$ lithium ion battery electrodes

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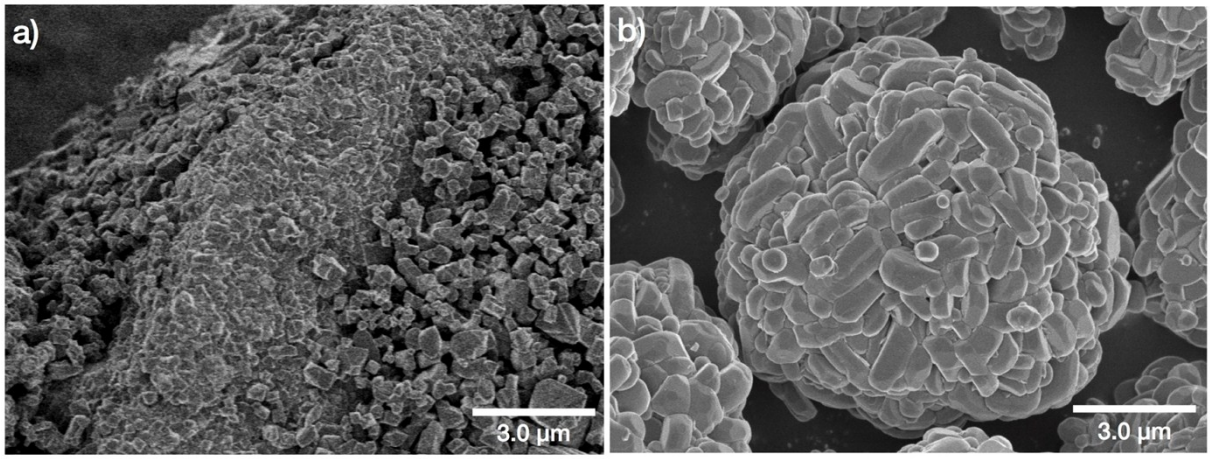

Fig. S1. SEM images of a) LMO and b) NMC

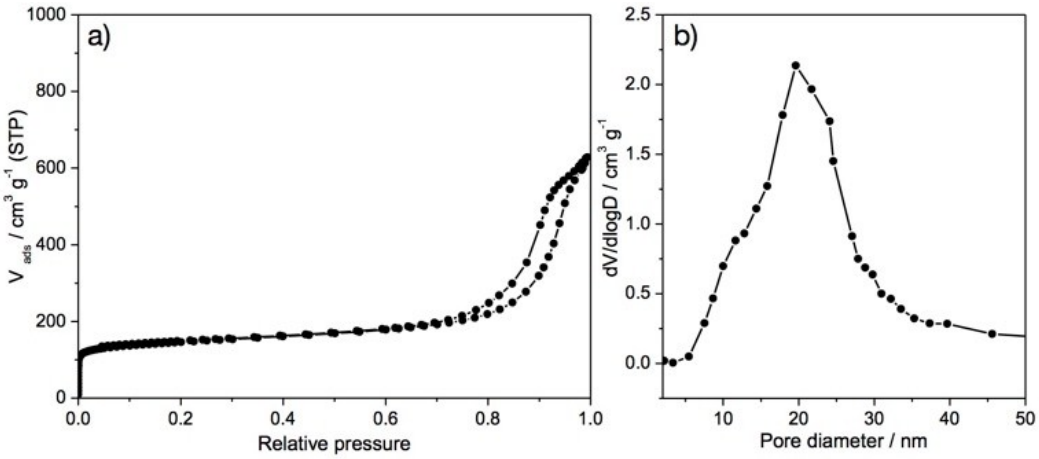

Fig. S2. a) N_2 adsorption-desorption isotherm and b) BJH pore size distribution (desorption branch) of A800.

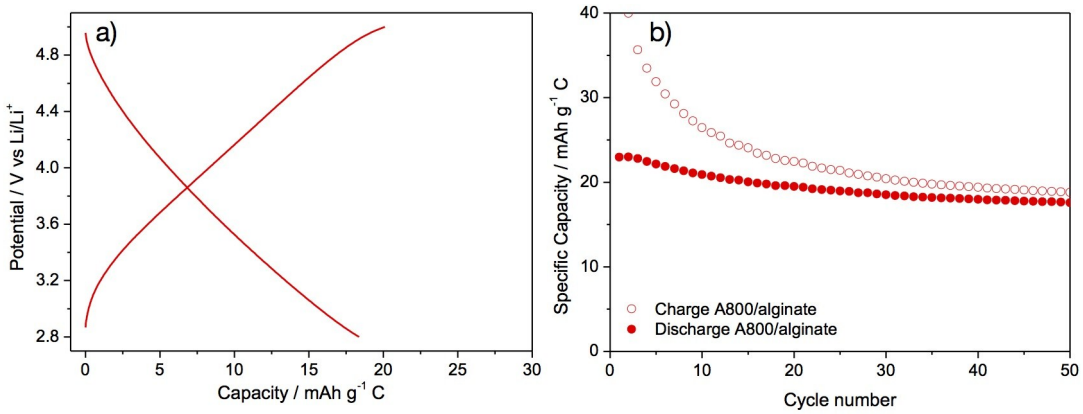

Fig.S3. a) Representative galvanostatic charge–discharge curves for A800/alginate electrode (ratio of 9:1) cycled at 100 mA g^{-1} within 2.8 – 5.0 V vs Li/Li^+ and b) its long term cycling test.

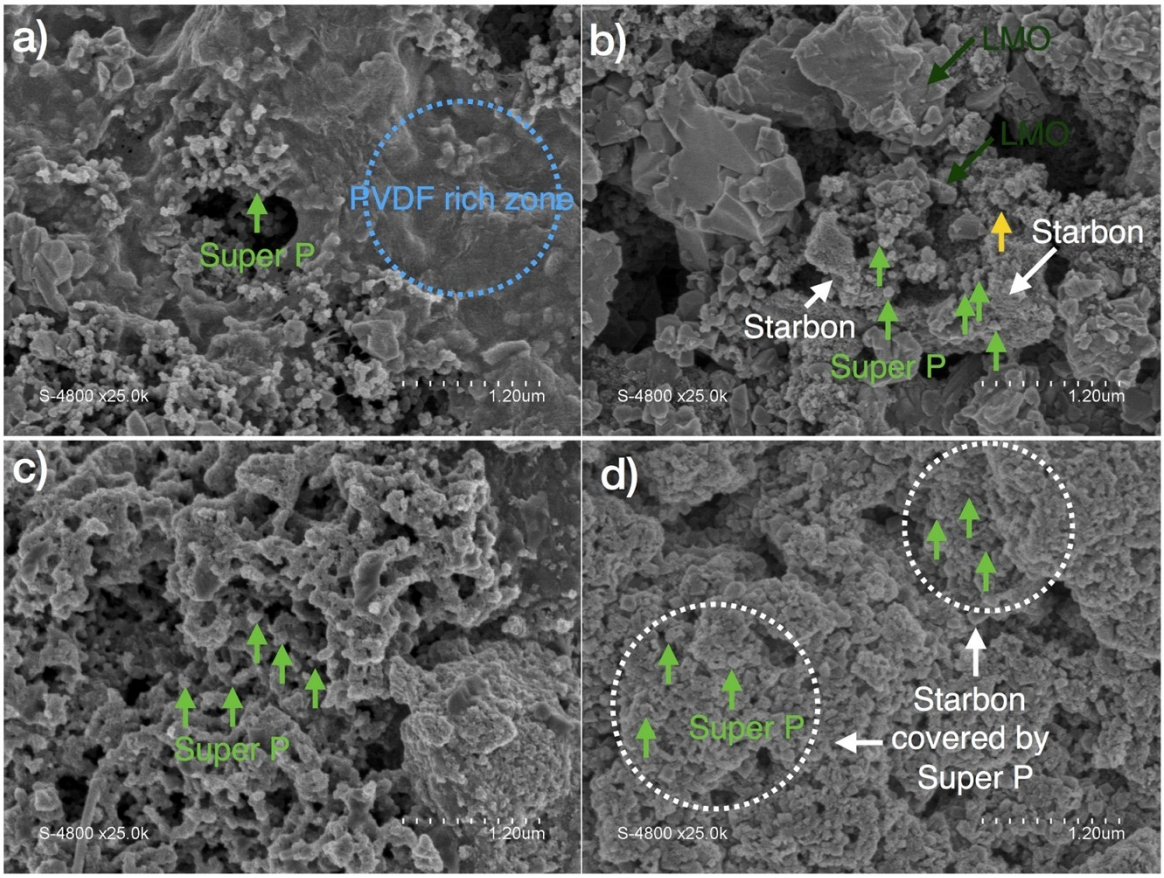

Fig. 4. SEM images of electrodes before cycling: a) LMO/Super P/PVDF, b) LMO/BC61/alginate and after 10 cycles at C/10: c) LMO/Super P/PVDF, d) LMO/BC61/alginate.

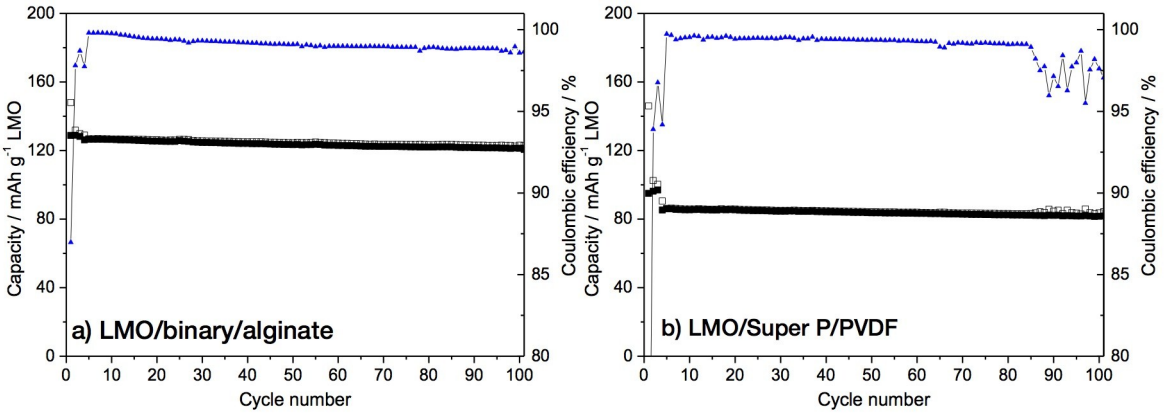

Fig. S5. Long term cycling test for a) LMO/binary carbon/alginate and b) LMO/Super P/PVDF electrodes at 1 C for 100 cycles. The first 3 cycles tested at 0.1 C.

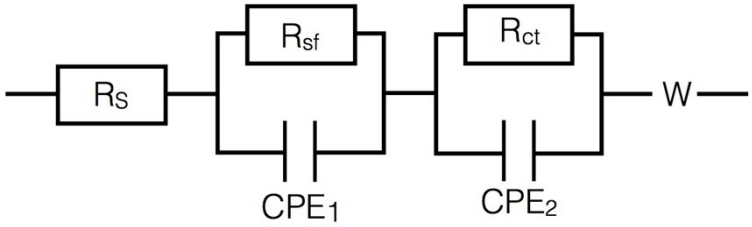

Fig. S6 Equivalent model used for EIS fitting.

	LMO/BC61/alginate	LMO/Super P/PVDF
R_s (ohm)	3.52	3.75
R_{ct} (ohm)	20.16	32.7
R_{sf} (ohm)	87.03	178.3
w (ohm $s^{-1/2}$)	147.7	214.5

Table S1. Impedance results. R_s stands for the ohmic resistance from the entire system such as the electrolyte, the cables, any copper wire placed between the connectors of the instrument, R_{cf} for the resistance from CEI layer, R_{ct} for the charge transfer resistance, w for Warburg impedance coefficient.