Electronic Supplementary Material (ESI) for RSC Advances.

ELECTRONIC SUPPLEMENTARY INFORMATION

A High Rate Li-Rich Layered MNC Cathode Material for Lithium-ion Batteries

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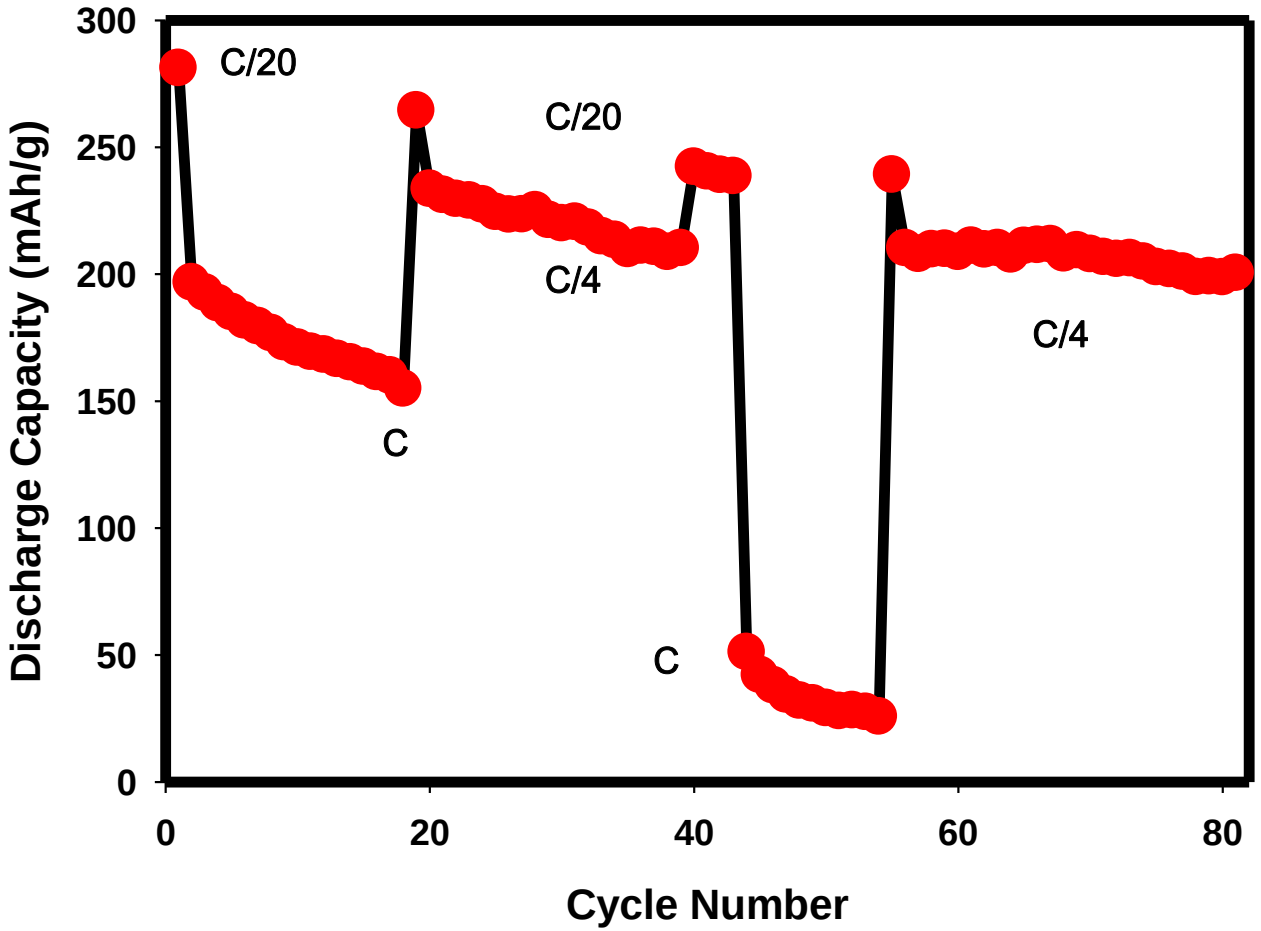


Figure S1. Cycling and rate performance of a Li cell with CP-MNC cycled between 2 and 4.9V at room temperature.

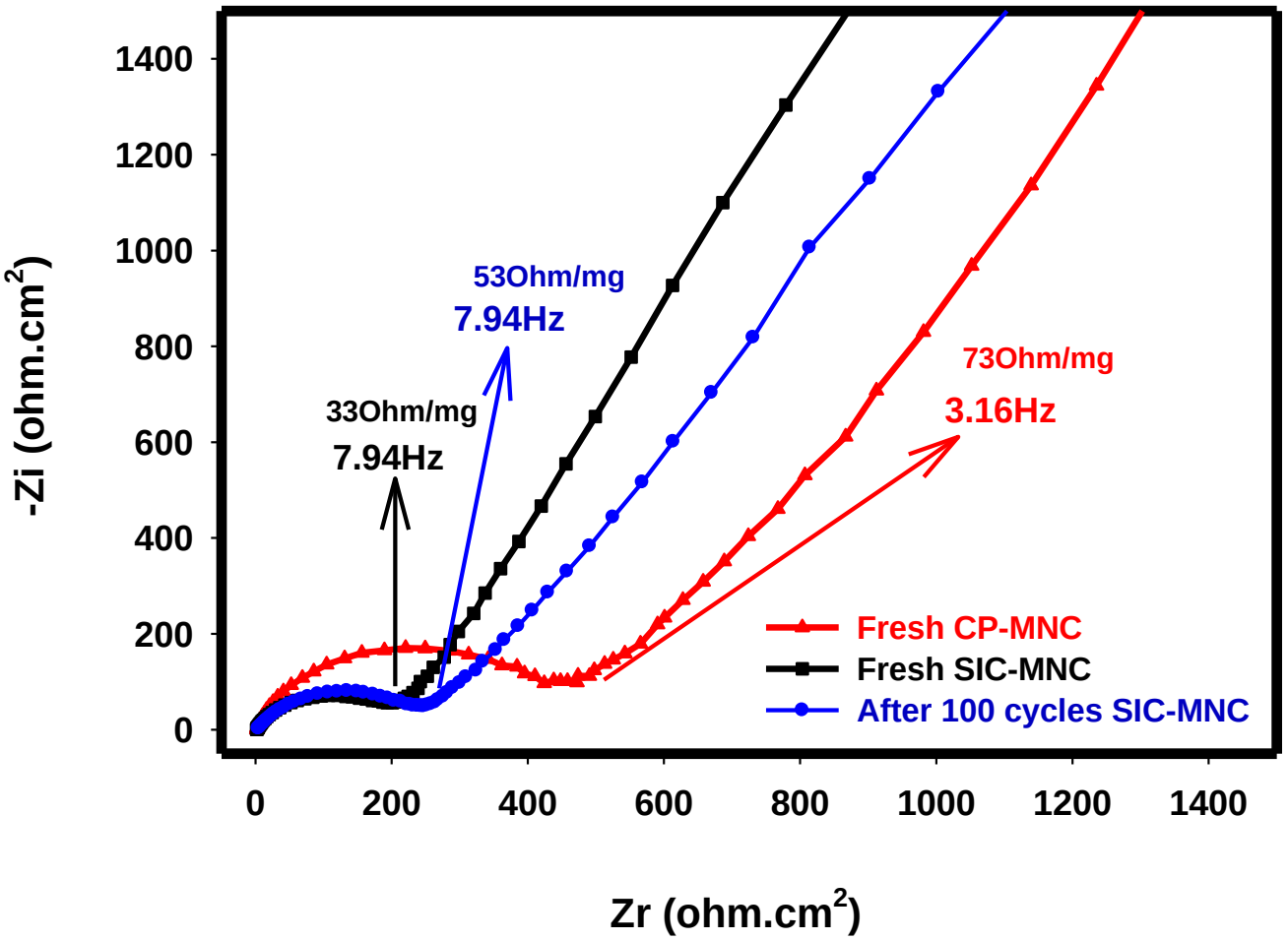
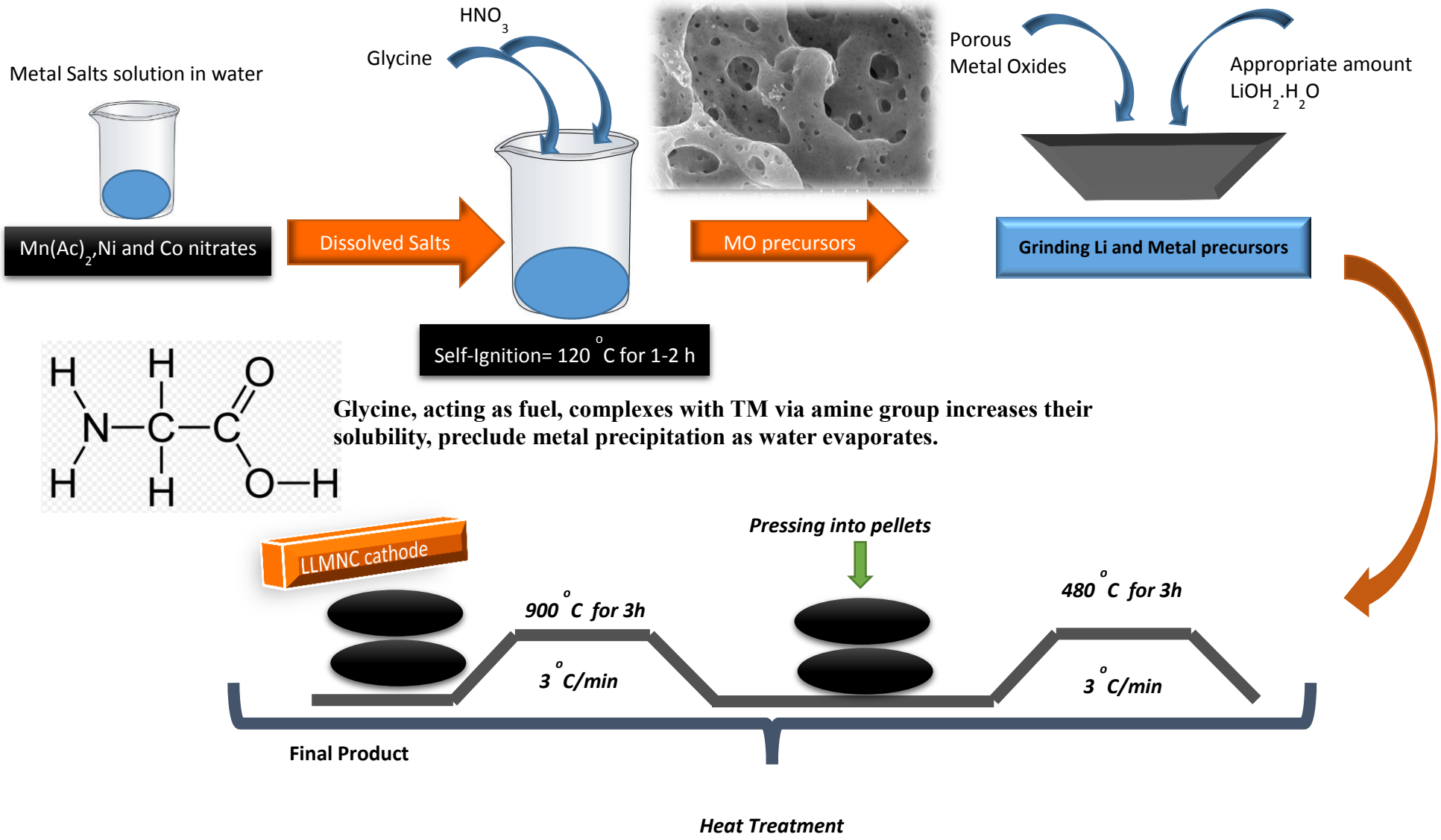


Figure S2. Nyquist plots of fresh Li cells prepared with SIC-MNC and CP-MNC at room temperature.



Scheme S1. An illustration of the novel SIC-MNC synthetic method. The FESEM image of a sponge-like open porous structure corresponds to the metal oxide precursor (MO precursor) shown in the scheme.

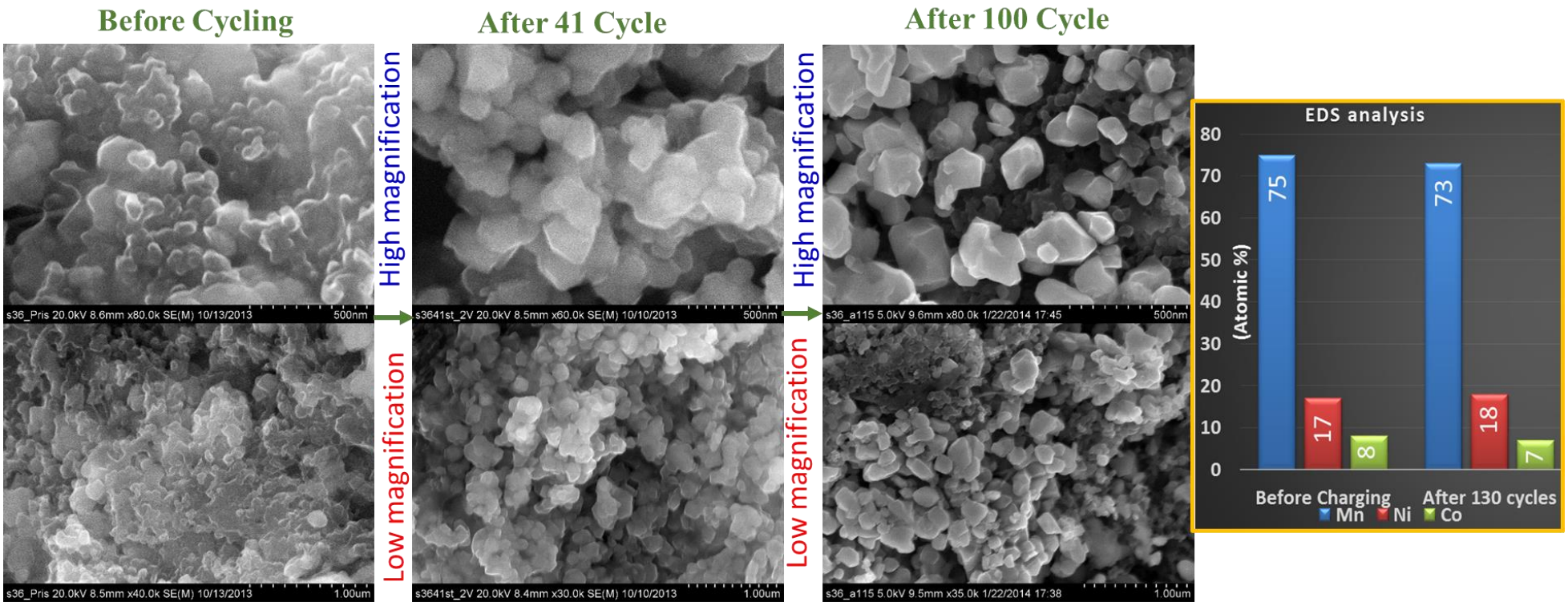


Figure S3. FESEM images of SIC-MNC cathodes collected after first, 41st and 100th cycles, each discharged to 2V. Bottom images shows low magnifications while the upper images show high magnifications. EDS results are depicted far right side of the picture.

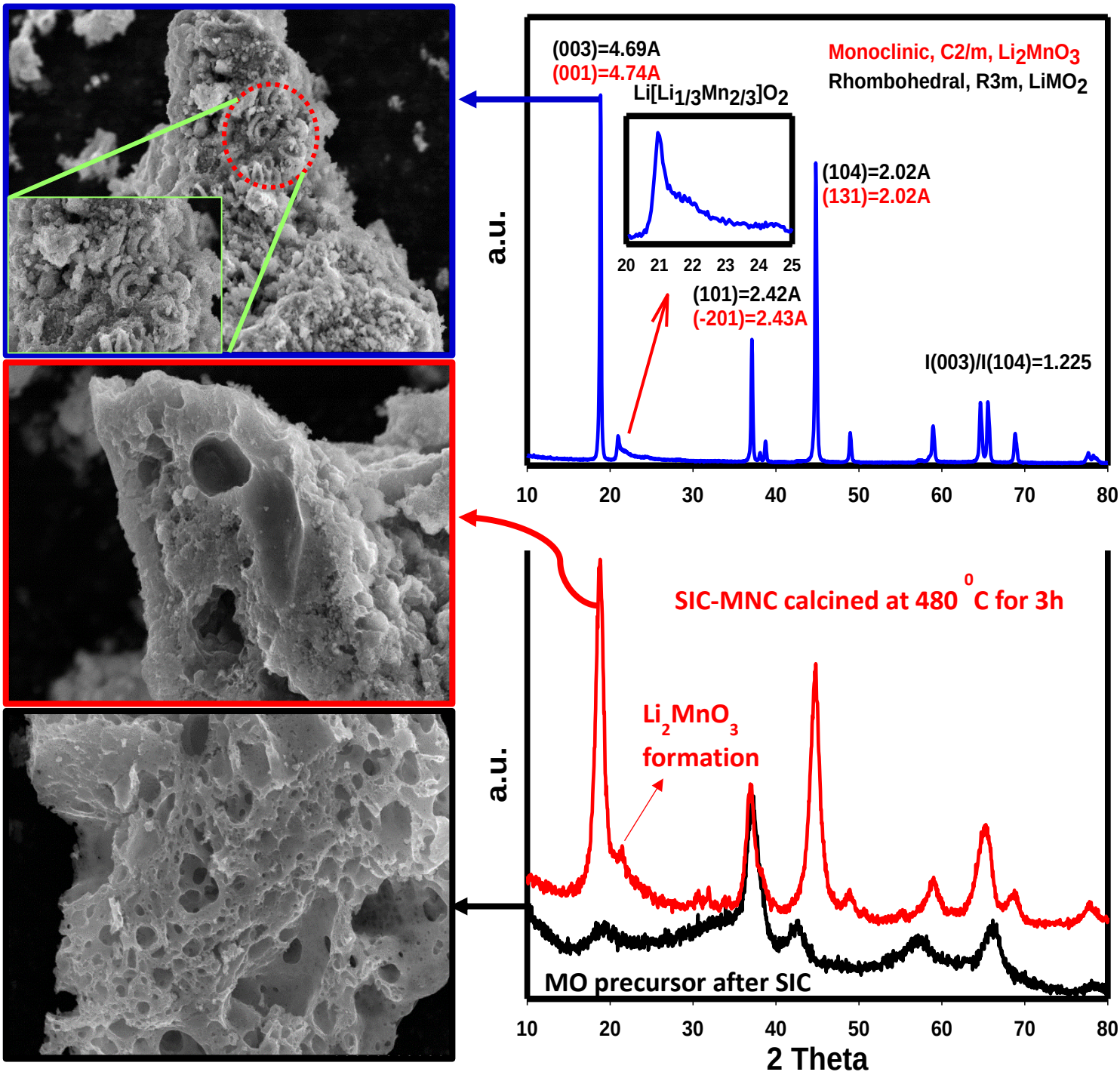


Figure S4. XRD evolution with respect to morphological changes observed by FESEM showing interconnected particles even after final heat treatment.

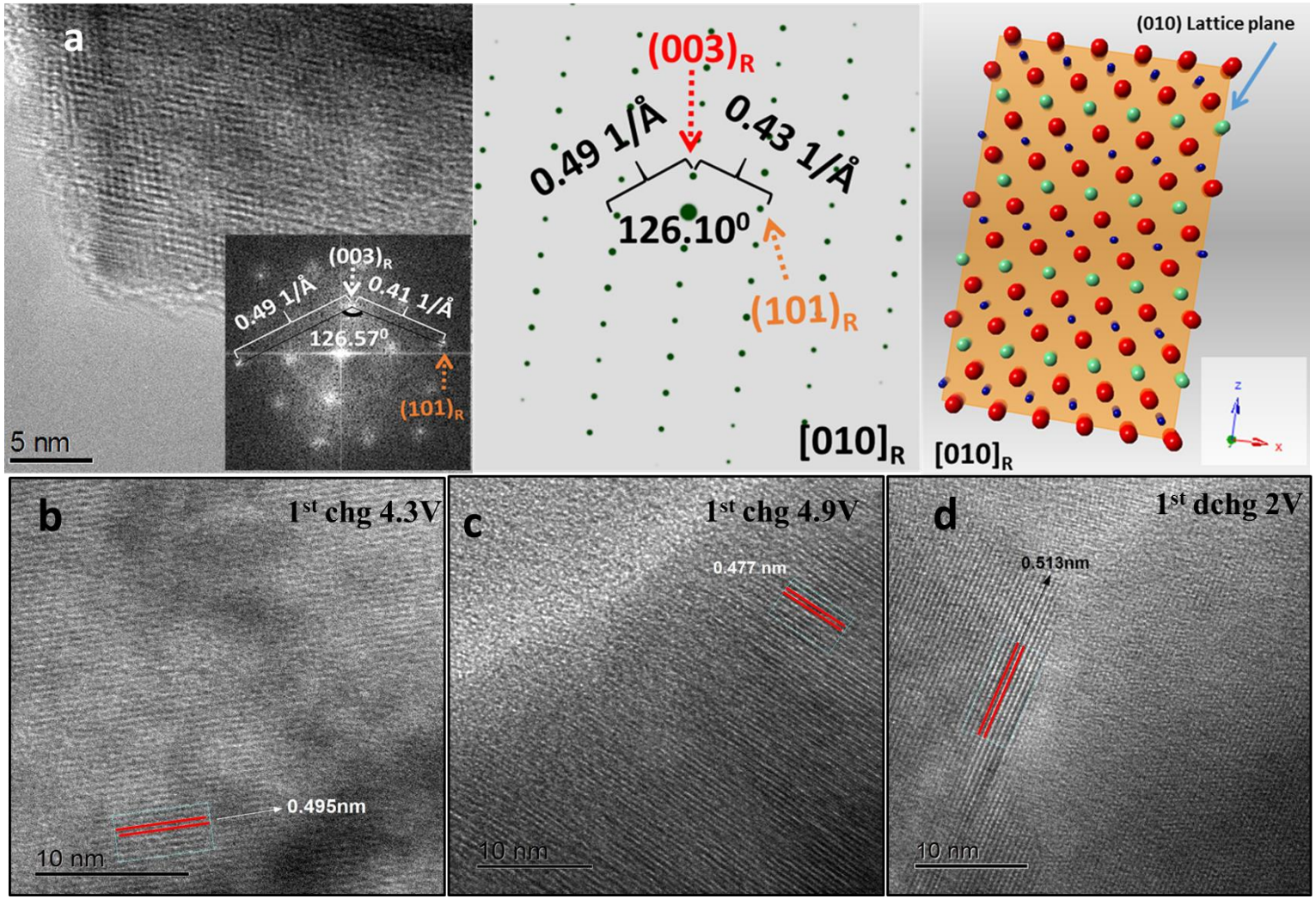


Figure S5. a-) HRTEM image along with FFT pattern during the first charging at 4.9V. HRTEM images display lattice fringes at b-) 4.3V c-) 4.9V during the first charge and d-) 2V during the first discharge.

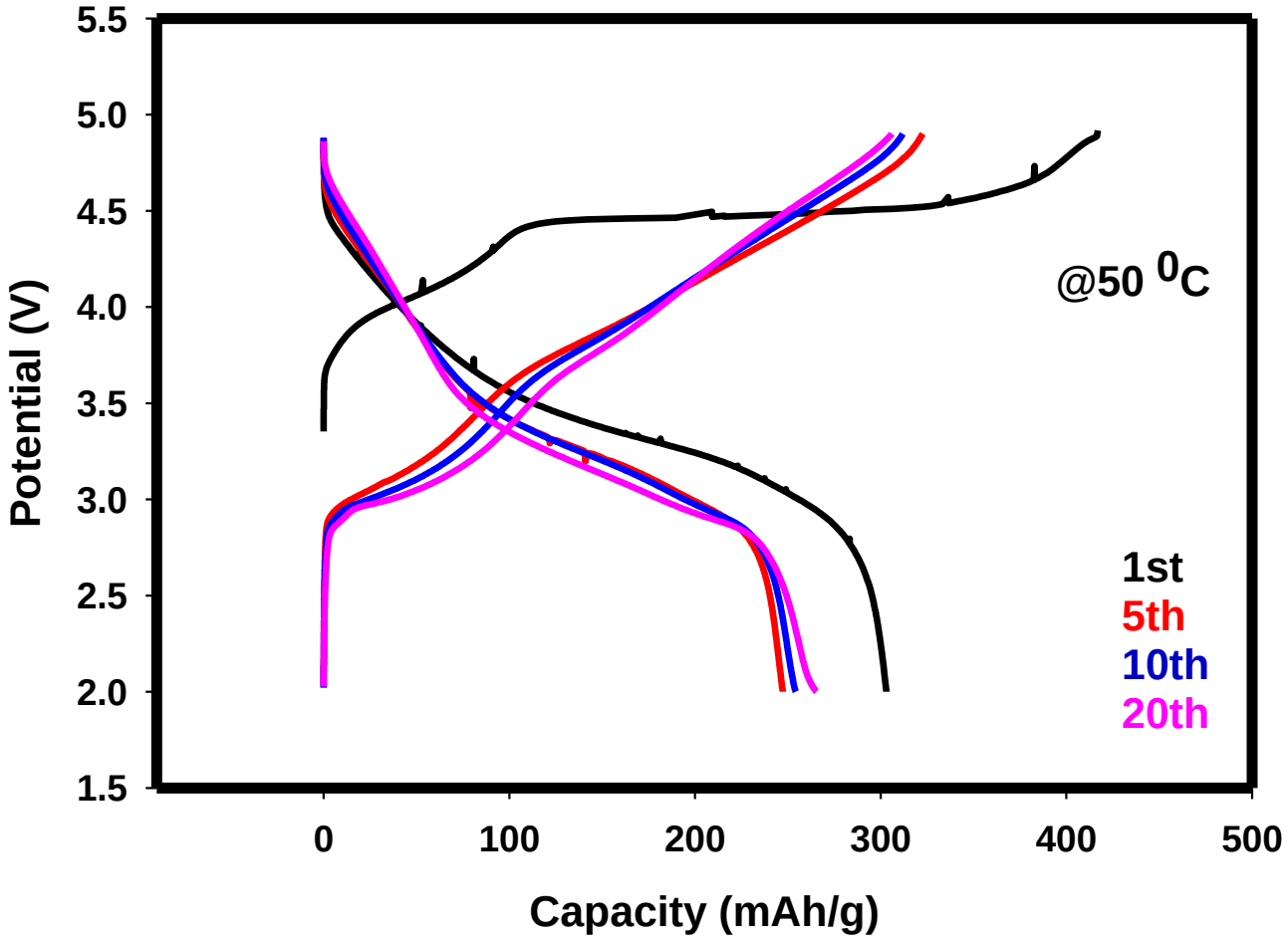


Figure S6. Charge-discharge voltage versus capacity profiles of the cell utilizing SIC-MNC at 50 ^{0}C. The first cycle rate was C/20 and the rest was C/4.