Supplementary Information

for

Controlled synthesis of yolk-mesoporous shell Si@SiO_2 nanohybrid designed for high performance Li ion battery

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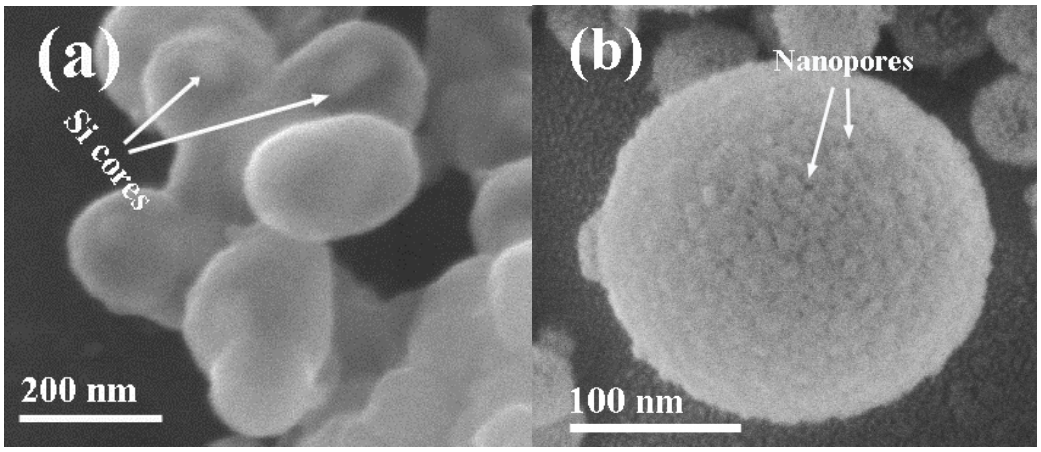
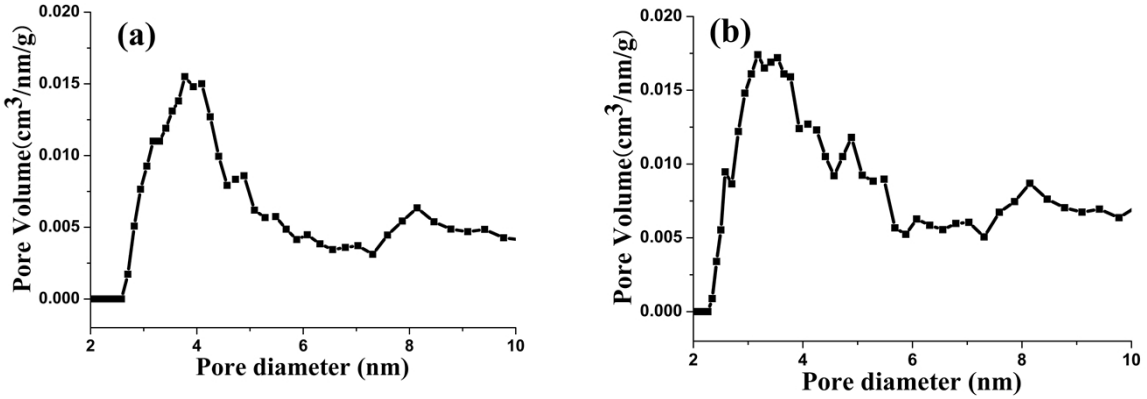


Figure S1. SEM images of YMSSN with different magnification.



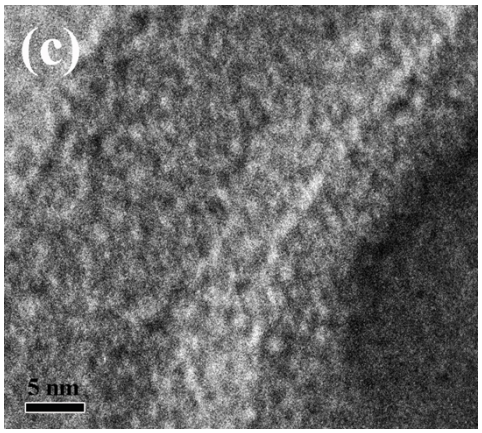


Figure S2. The pore size distributions of a) MHSS and b) YMSSN. c) The HRTEM image of a single YMSSN.

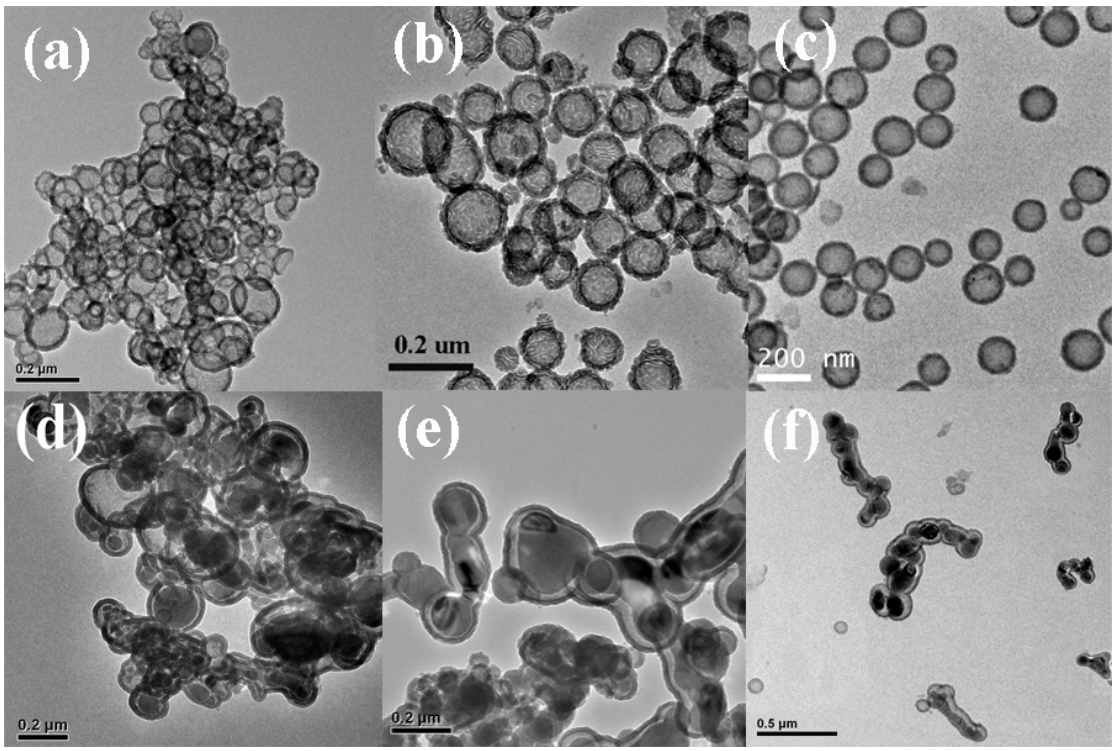


Figure S3. TEM images of the: (a-c) MHSS obtained at LSB/SDBS concentrations of 1× 10^{-5} M, 3 × 10^{-5} M and 5 × 10^{-5} M, respectively; (d-f) YMSSN obtained at LSB/SDBS concentrations of 1× 10^{-5} M, 3 × 10^{-5} M and 5 × 10^{-5} M, respectively.

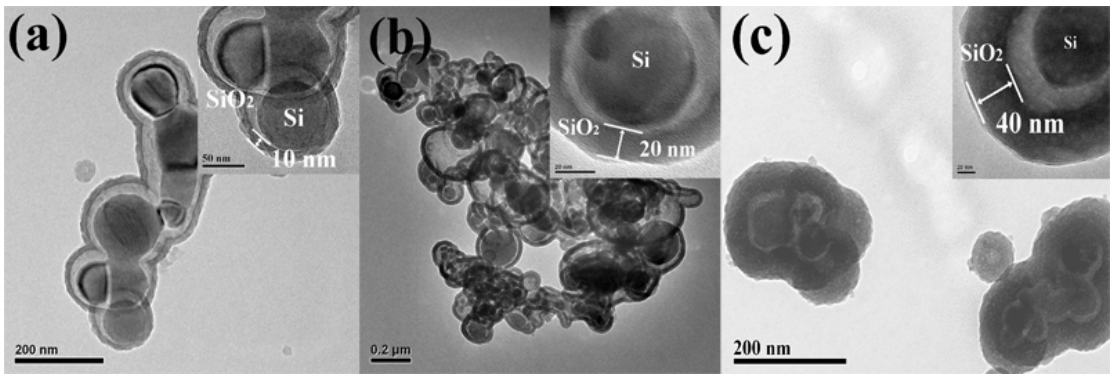


Figure S4.TEM images of the YMSSN obtained at: a-c) TEOS concentrations of 4 × 10^{-2} M, 7 × 10^{-2} M and 1.4 × 10^{-1} M, respectively.

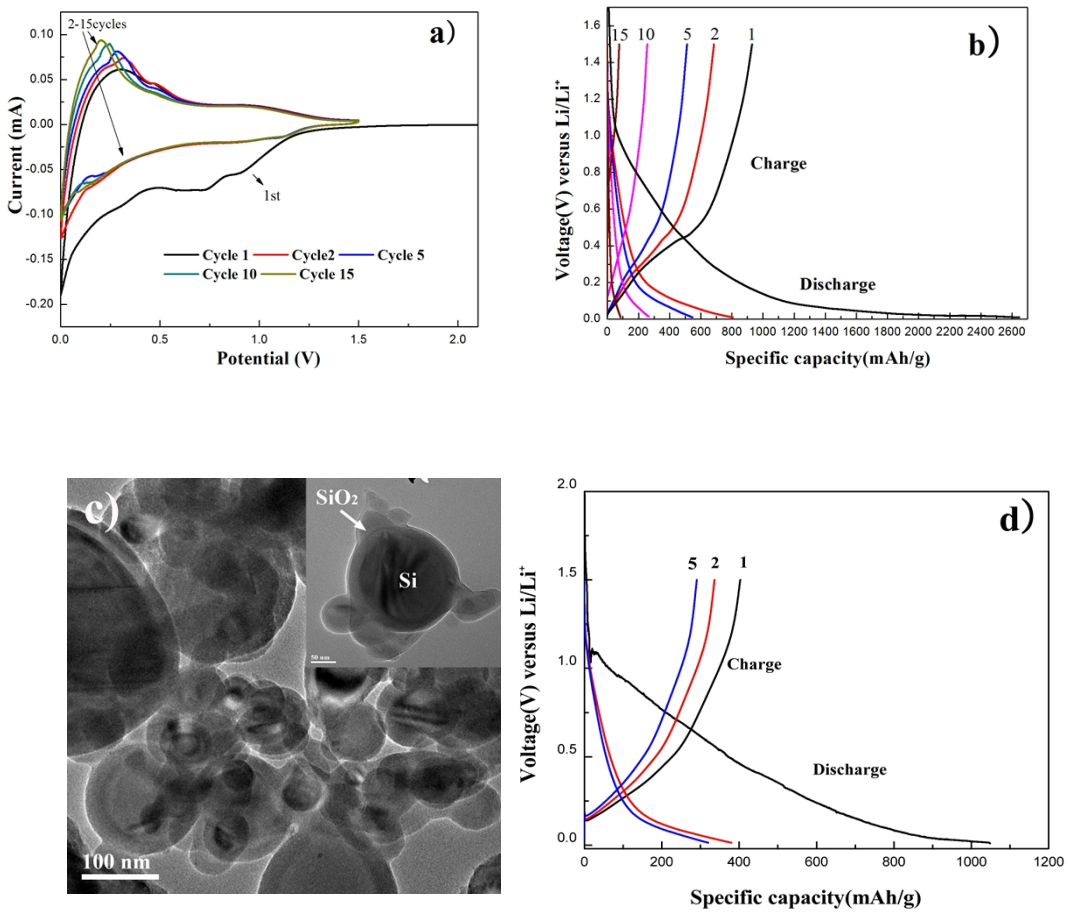


Figure S5. a) Cyclic voltammetry curve of the Si Nps showing the first fifteen cycles between 1.5 V and 0 V at a scan rate of 0.1 mV s^{-1}; b) Galvanostatic charge/discharge curves of Si Nps electrode at a current density of 50 mA g^{-1}. c) TEM images of the Si@silica composites with dense shell. d) Galvanostatic charge/discharge curves of Si@silica composites with dense shell electrode at a current density of 50 mA g^{-1}.

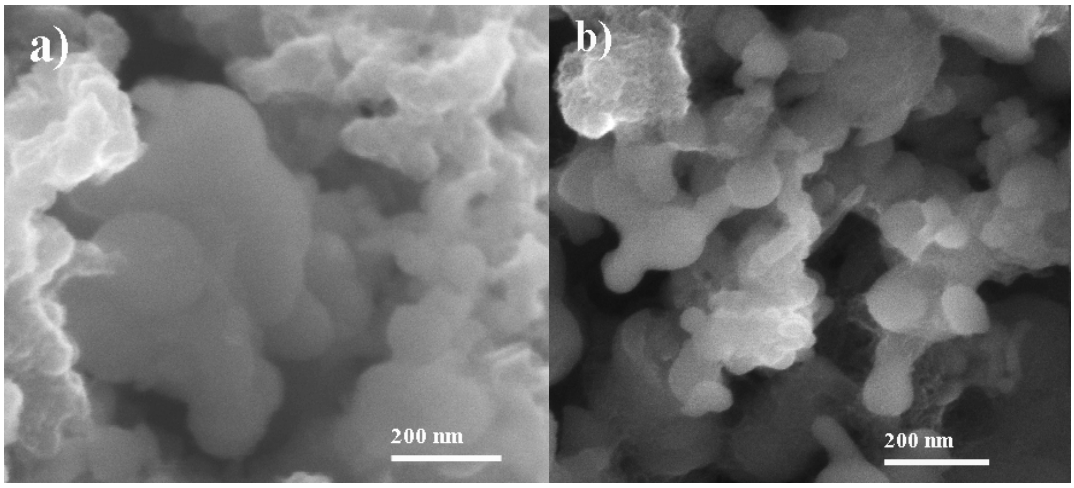


Figure S6. The SEM images of: a) bare Si Nps after 30 cycling and b) YMSSN after 30 cycling.