Electronic Supplementary Information for

Advanced Se/C nanocomposite: a bifunctional electrode material for both Li-Se and Li-ion batteries

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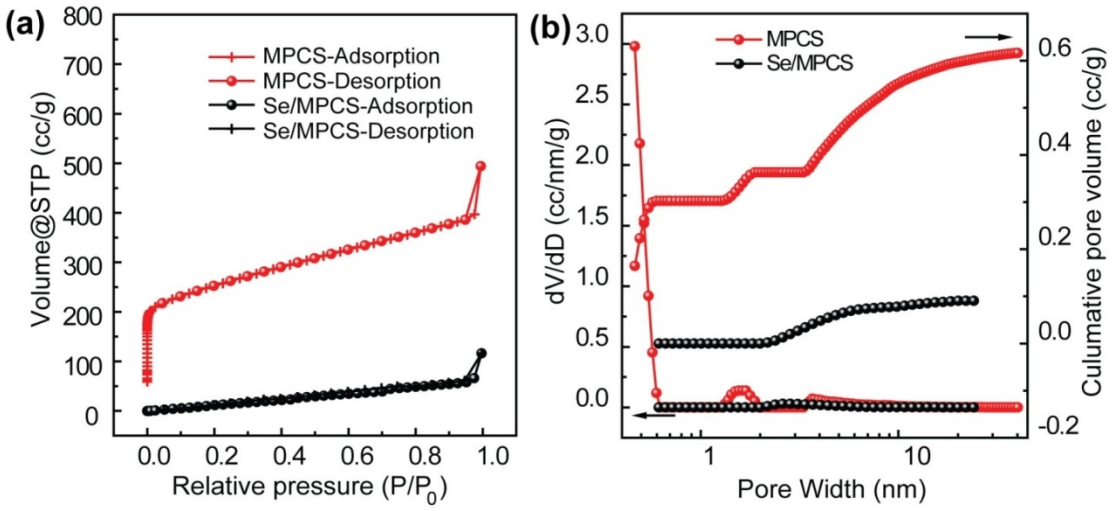

Fig. S1. (a) Nitrogen adsorption/desorption isotherms at 77 K of MPCS and Se/MPCS composite and (b) their pore size distributions.

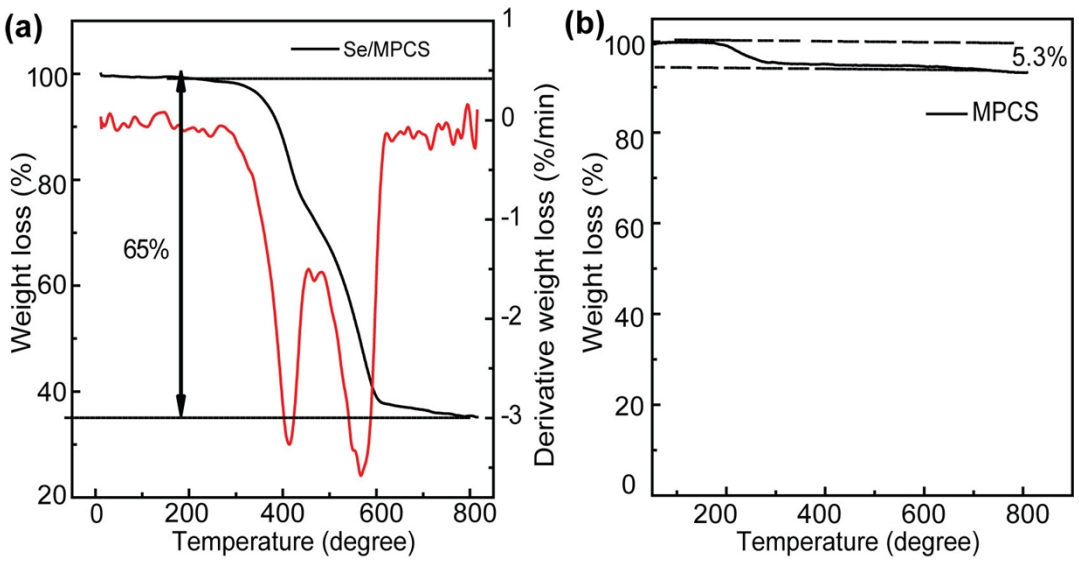

Fig. S2. (a) Thermalgravimetric analysis curve of Se/MPCS composite with a selenium content of 65 wt% , (b) TG analysis of MPCS.

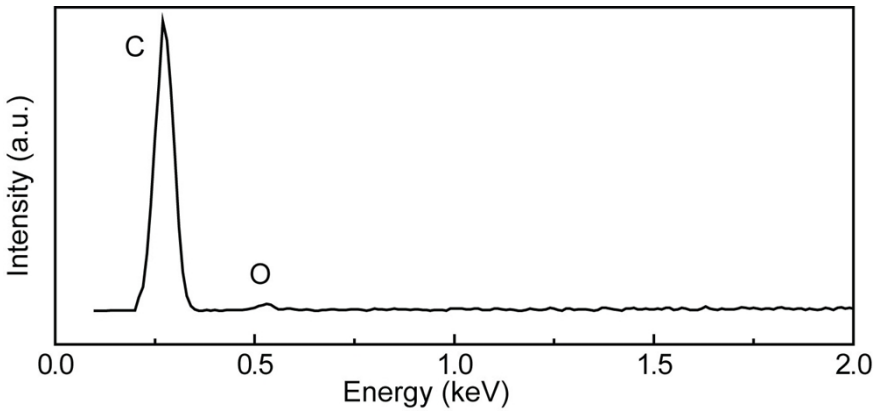

Fig. S3. Elemental analysis of Se/MPCS composite after TG analysis.

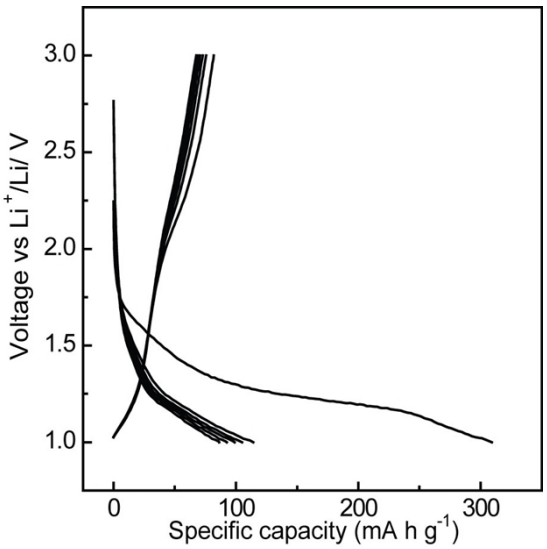

Fig. S4 Glavanostatic charge/discharge voltage profiles of MPCS for the first 6 cycles tested at 0.1C.

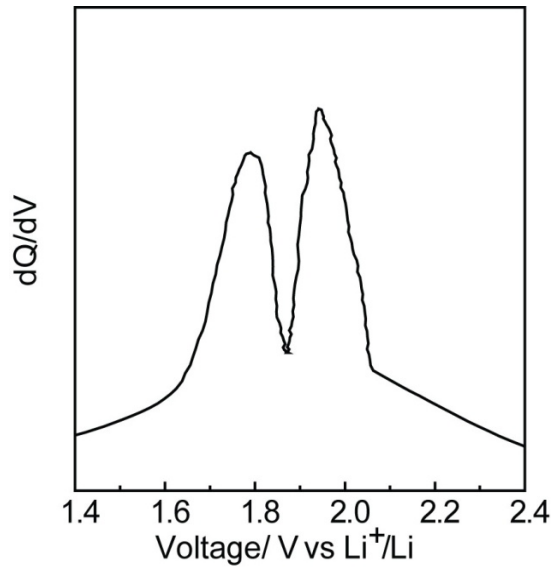

Fig. S5. The differential discharge capacity vs voltage curve of Se/MPCS composite electrode between 1-3 V.

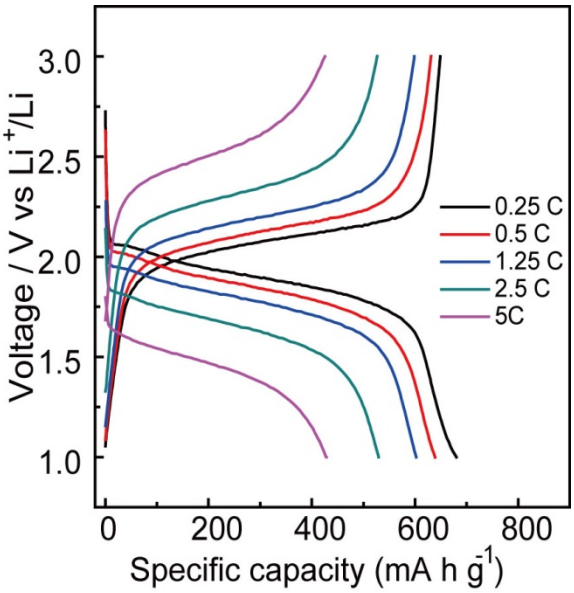

Fig. S6. GDC voltage profiles of the Se/MPCS electrode in the 6th cycle at different rates.

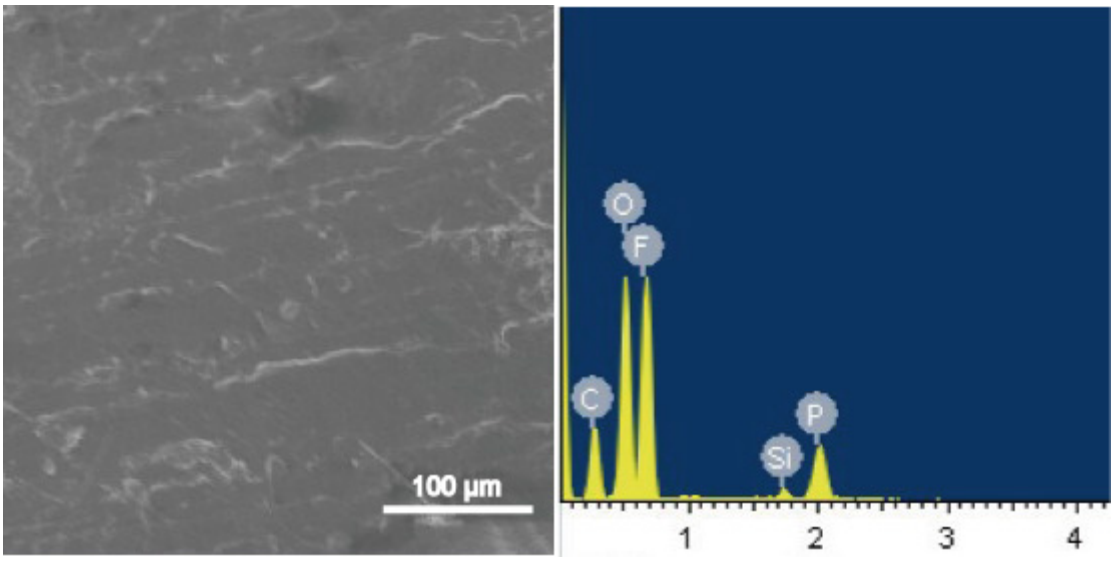

Fig. S7. *Ex situ* SEM characterization results of the lithium anode after 500 cycles.

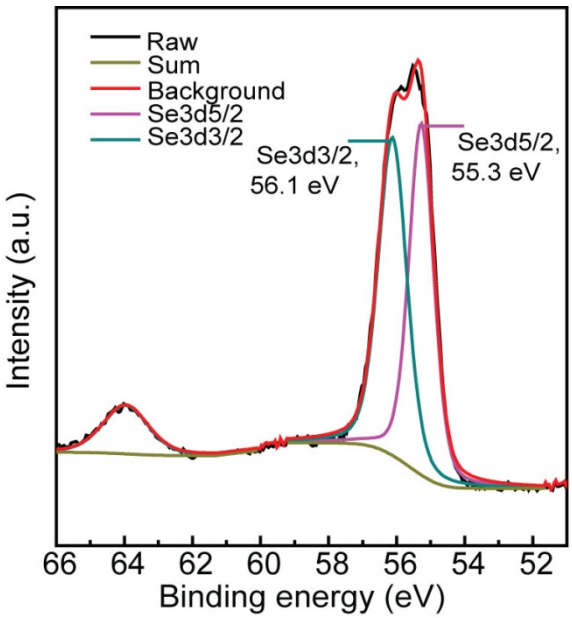

Fig. S8. XPS Se3d spectra of Se/MPCS composite before test.

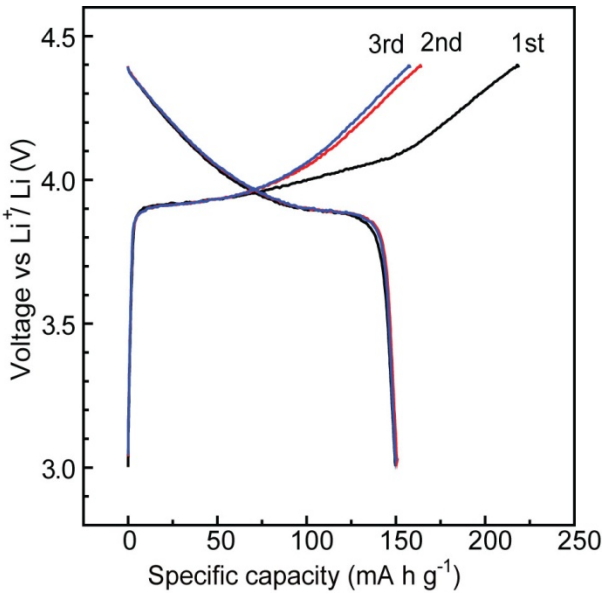

Fig. S9. GDC voltage profiles of NMC electrode in lithium cell at 0.2 C.

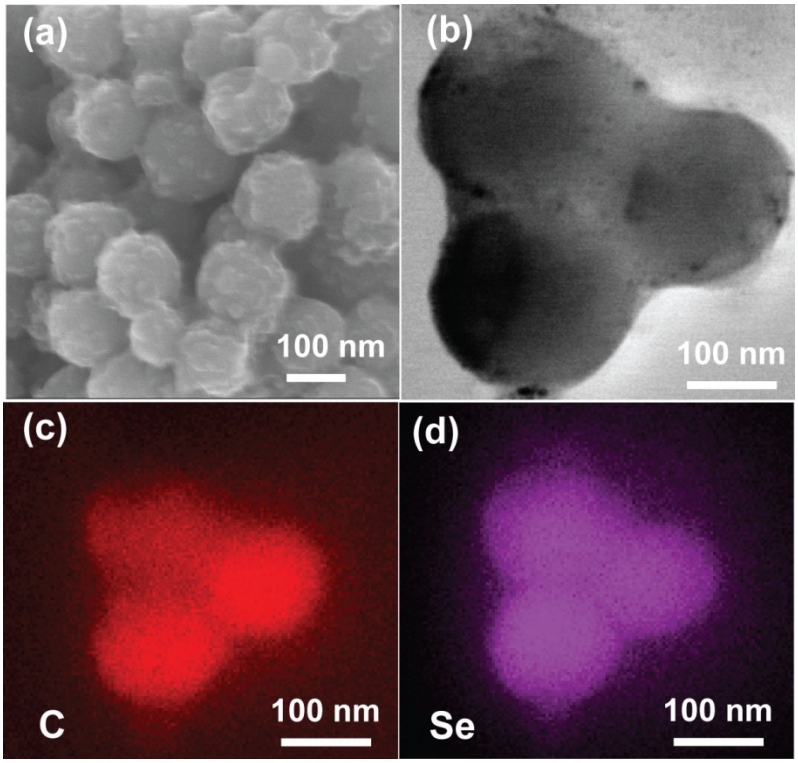

Fig. S10. Structural characterizations of Se/MPCS after 1000 cycles at 1 C. (a) *Ex situ* SEM image (b) annular bright-field TEM image of Se/MPCS, and EDX elemental mappings of (c) carbon and (d) selenium.