Supporting Information

Single-Crystal Intermetallic M-Sn (M = Fe, Cu, Co, Ni) Nanospheres as Negative Electrodes for Lithium-ion Batteries

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Figure S1 (a) High resolution TEM image of a single crystal of FeSn₂, viewed along $[10\bar{1}]$ direction; (b) the selected area electron diffraction patterns obtained by fast Fourier transform techniques.

Figure S2 Representative STEM-EDS point analysis of the center and the edge of (a) FeSn_2 , (b) Cu_6Sn_5 , (c) CoSn_3 and (d) Ni_3Sn_4 nanospheres. Left: STEM images showing the probing points; Right: EDS spectra.

Figure S3 Synchrotron XRD patterns of the cell with CoSn_3 nanospheres in different state-of-charge. *: CoSn_3 ; #: Cu (the current collector); and ^: Li (the counter electrode).

Figure S4 (a) Initial cycling curves; (b) differential dQ/dV curves of cells with different intermetallic systems.

Figure S5 Crystal Structures of (a) FeSn₂, (b) Cu₆Sn₅, (c) CoSn₃ and (d) Ni₃Sn₄.