Supporting Information

Lithiation/Delithiation Mechanism of Monodispersed MSn_5 (M=Fe, Co and FeCo) Nanospheres

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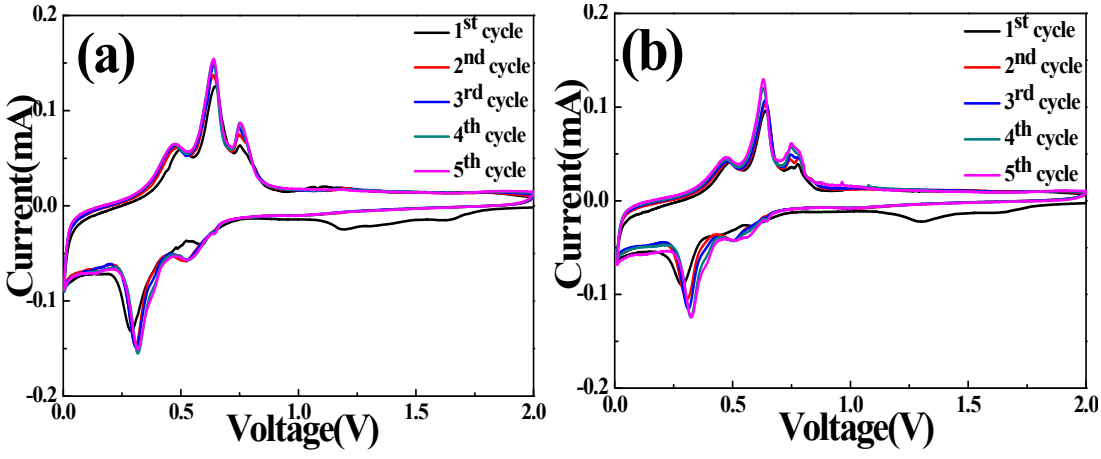
Table S1 A Calculated Partial Reflection Table Containing Cell Length, Cell Angle, Cell Volume, Atom Site, Occupancy of $FeSn_5$, $Fe_{0.5}Co_{0.5}Sn_5$ and $CoSn_5$.

Compound	$FeSn_5$	$Fe_{0.5}Co_{0.5}Sn_5$	$CoSn_5$
Rwp (%)	3	8.7	2.9
Cell length (a)	6.9137	6.9188	6.9328
Cell length (b)	6.9137	6.9188	6.9328
Cell length (c)	5.8897	5.8777	5.7924
Cell angle	α= β = γ =90°	α= β = γ =90°	α= β = γ =90°
Cell volume	281.5057	281.366	278.792
Atom site (Fe)	(0.5,0.5,0.25)	(0.5,0.5,0.25)	
Atom site (Co)		(0.5,0.5,0.25)	(0.5,0.5,0.25)
Atom site (Sn1)	(0,0,0.5)	(0,0,0.5)	(0,0,0.5)
Atom site (Sn2)	(0.190, 0.607, 1/2)	(0.193, 0.606, 1/2)	(0.191, 0.610, 1/2)
Occupancy(Fe)	0.74	0.345	
Occupancy(Co)		0.345	0.83
Occupancy(Sn)	1	1	1



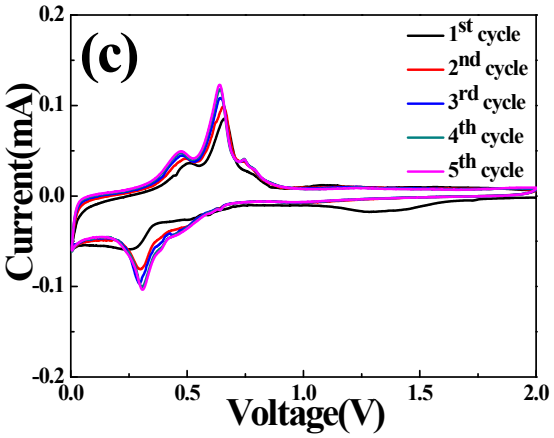


Fig. S1 a-c) Cyclic voltammograms of the initial five cycles scanned at a rate of 0.02 mV/s between 0.01-2 V in $FeSn_5$, $Fe_{0.5}Co_{0.5}Sn_5$ and $CoSn_5$ nanospheres electrode in Li-ion batteries.

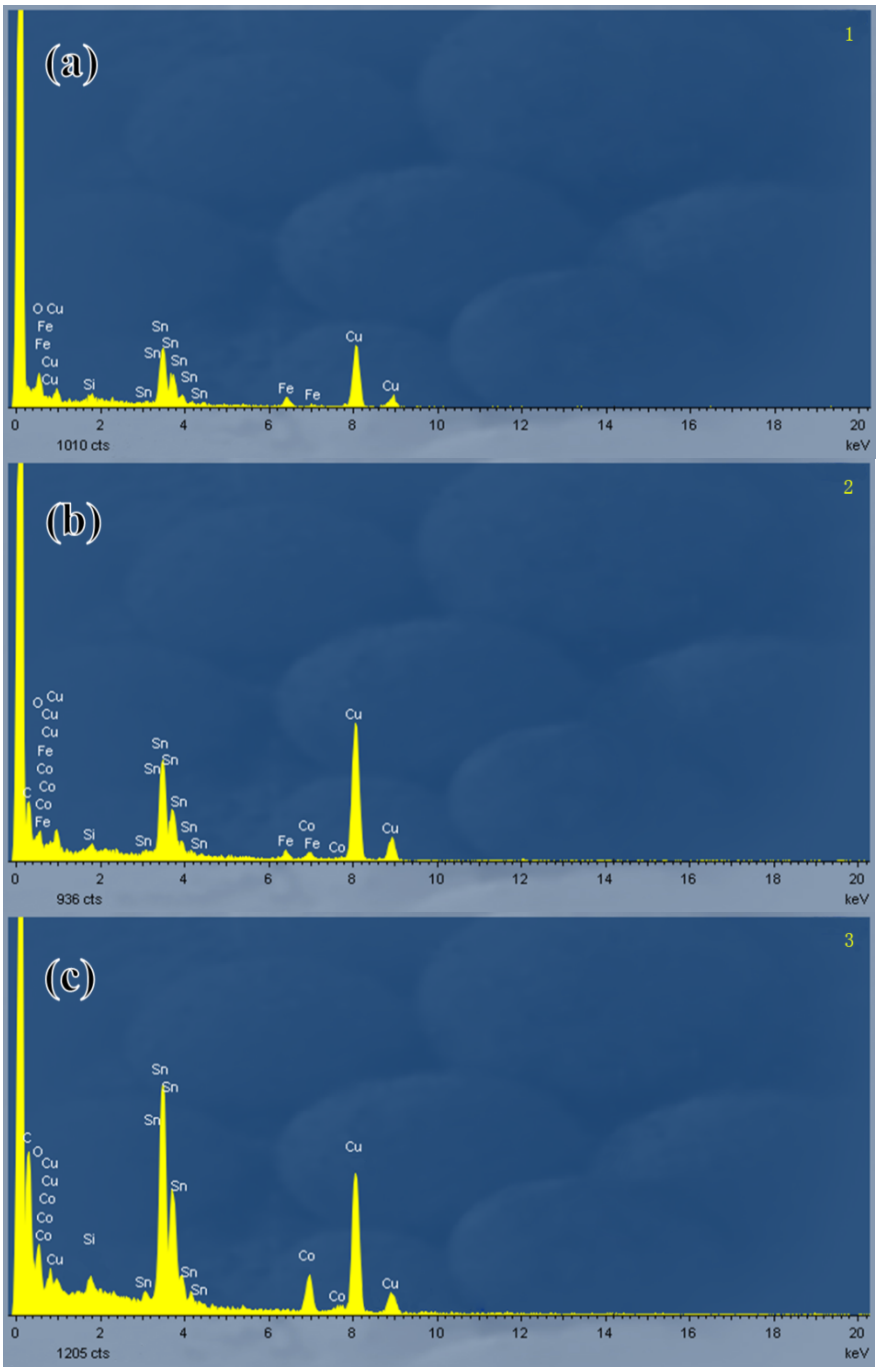


Fig. S2 a-c) The EDS spectrum of $FeSn_5$, $Fe_{0.5}Co_{0.5}Sn_5$ and $CoSn_5$ nanospheres after the first cycle.

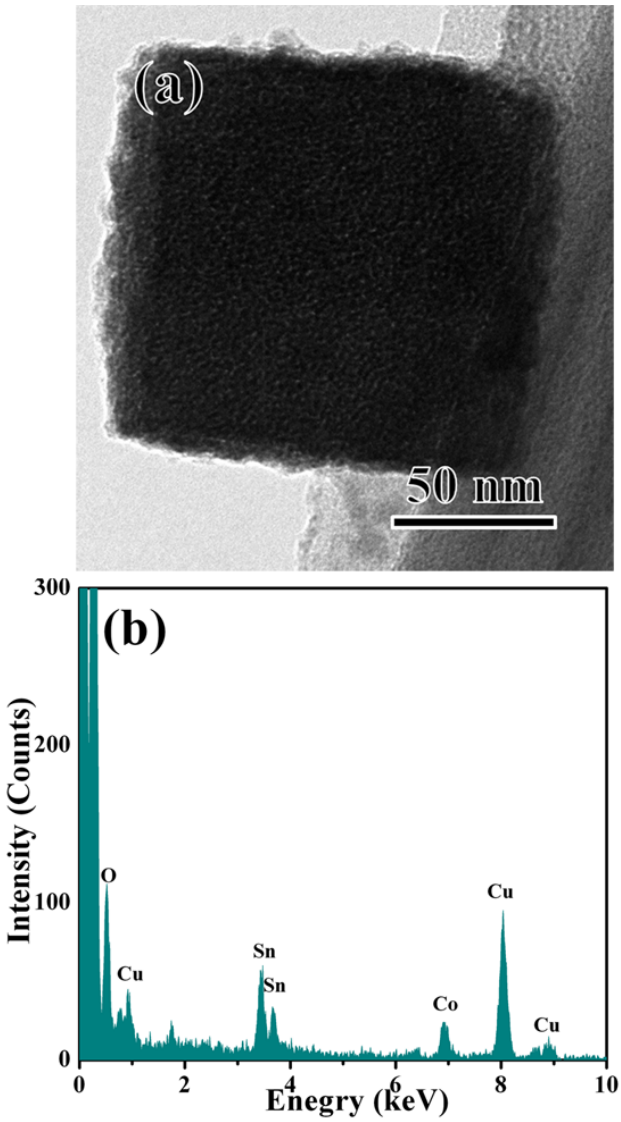


Fig. S3 a) TEM and b) EDS images $Fe_{0.5}Co_{0.5}Sn_5$ nanospheres after 100 cycles.

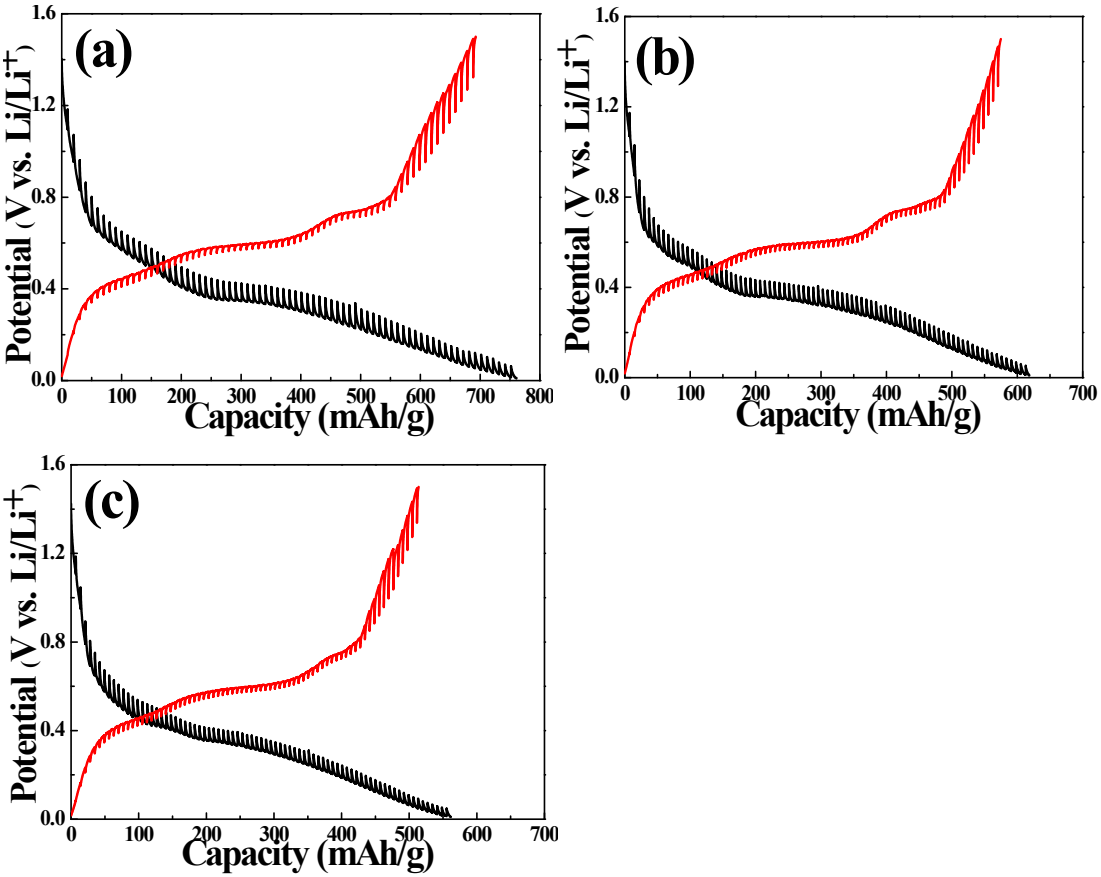


Fig. S4 Comparison of potential response of a) $FeSn_5$ and b, c) $Fe_{0.5}Co_{0.5}Sn_5$ and $CoSn_5$ nanospheres anodes from GITT measurements in Li-ion batteries at 20 mA g^{-1}, Before GITT measurement, the MSn_5 intermetallics were pre-charged/discharged for 5 cycles to active the electrodes.