Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Industrialization of Tailoring Spherical Cathode Material towards High-Capacity, Cycling-Stable and Superior Low Temperature Performance for Lithium-Ion Batteries

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Table S1 Total chemical composition of as-obtained precursors by ICP analysis

	Measured molar ratio			Designed molar ratio		
	Ni	Co	Mn	Ni	Co	Mn
NCM-3	0.598	0.198	0.204	0.6	0.2	0.2
NCM-6	0.599	0.196	0.205	0.6	0.2	0.2
NCM-12	0.598	0.199	0.203	0.6	0.2	0.2

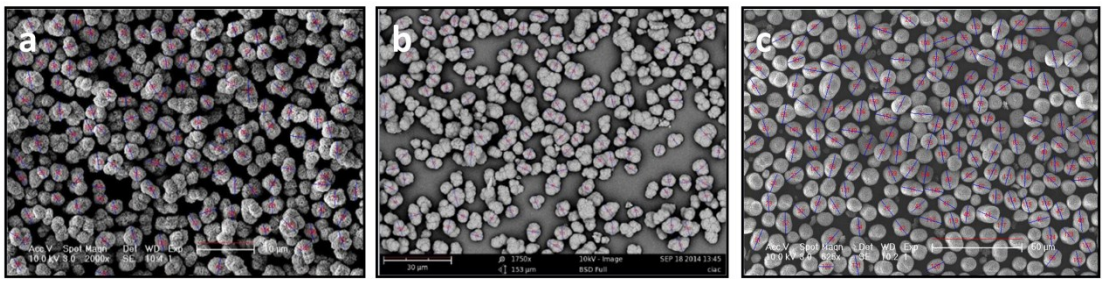

Figure S1 SEM images of the as-obtained $Li[Ni_{0.6}Co_{0.2}Mn_{0.2}]O_2$ with different conditions were used to measure the particle size.

Table S2 Summary of the representative $LiNi_{0.6}Co_{0.2}Mn_{0.2}O_2$-based cathode materials for LIBs.

Preparation Method	**Cycling Performance**	**Rate Capability**	**Ref.**
Co-precipitation	161.4 mAh g^{-1} after 100 cycles at 180 mA g^{-1}	152.7 mAh g^{-1} at 500 mA g^{-1}	[S1]
Combustion	166.9 mAh g^{-1} after 30 cycles at 20 mA g^{-1}	92 mAh g^{-1} at 320 mA g^{-1}	[S2]
Ultrasonic spray pyrolysis	146.0 mAh g^{-1} after 100 cycles at 170 mA g^{-1}	131.9 mAh g^{-1} at 850 mA g^{-1}	[S3]
Co-precipitation	150.4 mAh g^{-1} after 225 cycles at 180 mA g^{-1}	170.0 mAh g^{-1} at 500 mA g^{-1}	[S4]
Fluorinesubstitution	132.8 mAh g^{-1} after 50 cycles at 170 mA g^{-1}	130.0 mAh g^{-1} at 850 mA g^{-1}	[S5]
Co-precipitation	169.02 mAh g^{-1}after 100 cycles at 90 mA g^{-1}	166 mAh g^{-1} at 900 mA g^{-1}	[S6]
Spray drying	110.8 mAh g^{-1} after 40 cycles at 800 mA g^{-1}	125 mAh g^{-1} at 800 mA g^{-1}	[S7]
Co-precipitation	158.68 mAh g^{-1} after 100 cycles at 90 mA g^{-1}	171 mAh g^{-1} at 90 mA g^{-1}	[S8]

Co-precipitation	122.98 mAh g^{-1} after 100 cycles at 18 mA g^{-1}	172.8 mAh g^{-1} at 18 mA g^{-1}	[S9]
Co-precipitation	151.6 mAh g^{-1} after 50 cycles at 68 mA g^{-1}	170 mAh g^{-1} at 34 mA g^{-1}	[S10]
Co-precipitation	**172 mAh g^{-1} after 300 cycles at 180 mA g^{-1}**	**149 mAh g^{-1} at 900 mA g^{-1}**	**Present work**

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