

Electronic Supplementary Information

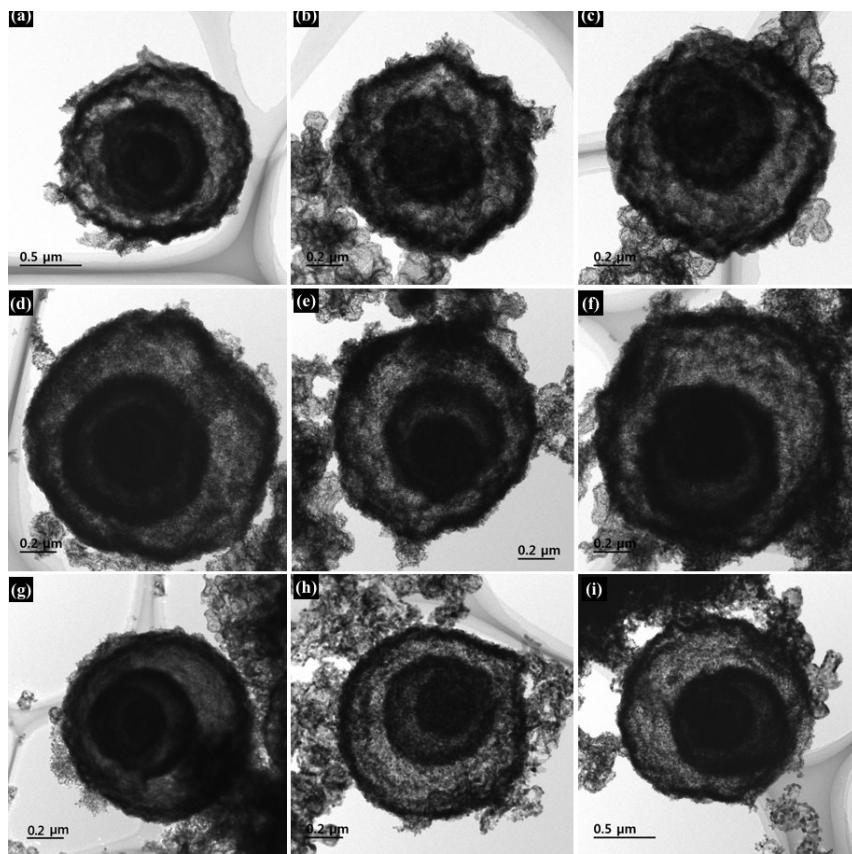
## Multi-shelled MgCo<sub>2</sub>O<sub>4</sub> hollow microspheres as anodes for lithium ion batteries

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**Table S1** Structural characteristics of MCO-300, MCO-400, and MCO-500

		Structural characterization		
		MCO-300	MCO-400	MCO-500
Diameter (μm)	1 <sup>st</sup> shell	1.13-1.67	1.12-1.41	0.98-1.53
	2 <sup>nd</sup> shell	0.67-0.90	0.61-0.82	0.58-0.92
	3 <sup>rd</sup> shell	0.31-0.49	0.40-0.43	0.34-0.56
	4 <sup>th</sup> shell	-	0.17-0.22	0.13-0.28
Thickness (nm)	1 <sup>st</sup> shell	94-118	83-91	75-125
	2 <sup>nd</sup> shell	85-125	67-120	50-111
	3 <sup>rd</sup> shell	75-100	50-73	63-96
	4 <sup>th</sup> shell	-	36-45	33-56
Distance (nm)	1 <sup>st</sup> void	106-283	213-327	183-236
	2 <sup>nd</sup> void	55-113	67-133	110-148
	3 <sup>rd</sup> void	48-83	33-101	27-56
	4 <sup>th</sup> void	-	55-100	55-83



**Fig. S1** TEM images of (a-c) MCO-300, (d-f) MCO-400, and (g-i) MCO-500 at various magnifications.

**Table S2** Comparison of electrochemical performances for  $\text{MgCo}_2\text{O}_4$  and other ternary cobalt oxide electrodes.

Material	Current density	Capacity retention	Refs.
$\text{MgCo}_2\text{O}_4$ particles	$60 \text{ mA g}^{-1}$	$816 \text{ mAh g}^{-1}$ after 50 cycles	4
$\text{NiCo}_2\text{O}_4$ hollow spheres	$200 \text{ mA g}^{-1}$	$706 \text{ mAh g}^{-1}$ after 100 cycles	33
Yolk-shelled $\text{ZnCo}_2\text{O}_4$ microspheres	$500 \text{ mA g}^{-1}$	$718 \text{ mAh g}^{-1}$ after 100 cycles	38
$\text{MgCo}_2\text{O}_4$ nanofibers	$240 \text{ mA g}^{-1}$	$411 \text{ mAh g}^{-1}$ after 50 cycles	40
$\text{FeCo}_2\text{O}_4$ nanoflakes	$200 \text{ mA g}^{-1}$	$905 \text{ mAh g}^{-1}$ after 170 cycles	48
Double-shelled $\text{ZnCo}_2\text{O}_4$ hollow microspheres	$90 \text{ mA g}^{-1}$	$1019 \text{ mAh g}^{-1}$ after 120 cycles	49
Porous carbon-coated $\text{CuCo}_2\text{O}_4$ concave	$100 \text{ mA g}^{-1}$	$740 \text{ mAh g}^{-1}$ after 50 cycles	50
Quadruple-shelled $\text{MgCo}_2\text{O}_4$ microspheres	$500 \text{ mA g}^{-1}$	$1360 \text{ mAh g}^{-1}$ after 100 cycles	This work