Electronic Supporting Information for

Egg-shell Structure LiCoO$_2$ by Cu$^{2+}$ Substitution to Li$^+$ Site via Facile Stirring in an Aqueous Copper (II) Nitrate Solution

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Fig. S1 XRD patterns from the stirred LiCoO$_2$ in the 5 M Cu(NO$_3$)$_2$ solution for 7 days.
Fig. S2 SEM images of a) the bare LiCoO$_2$ and the surface modified LiCoO$_2$ after stirring in the 0.5 mM CuNO$_3$ solution by b) 6, c) 24, d) 72 and e) 144 hrs.
Fig. S3 a) TEM image of egg-shell structure LiCoO$_2$, b) EDS mapping images for b) Cu, c) Co and d) O. f) Co XPS spectra from the pristine and the 24 hr-LCO before cycling.
Fig. S4 Voltage curves at the 1st cycle from the coin type cells having pristine LiCoO₂ and the surface modified LiCoO₂ with different stirring time.
Fig. S5 Voltage curves obtained at the 6th, 100th, 300th and 500th cycle from the cell having a) pristine, b) 6hr-, c) 24hr-, d) 72hr-, and e) 144hr- LCO. f) The differential capacity vs. potential curves from the pristine and the 24hr-LCO cell are depicted.
Fig. S6 FE-SEM images of the 500 times cycled electrode of a) pristine, b) 6hr-LCO and c) 24hr-LCO. Bottom images are enlarged one from the white dot square in upper images.
Fig. S7 Cycle life of the 2032 type coin cells having the pristine LiCoO$_2$ and 24-hr LiCoO$_2$ with a high cut-off condition of 4.6 V vs. Li/Li$^+$ at room temperature.