

Supporting Information

In-Situ Formed Lithium Ionic Conductor Thin Film on the Surface of High-Crystal-Layered LiCoO_2 as High-Voltage Cathode Materials

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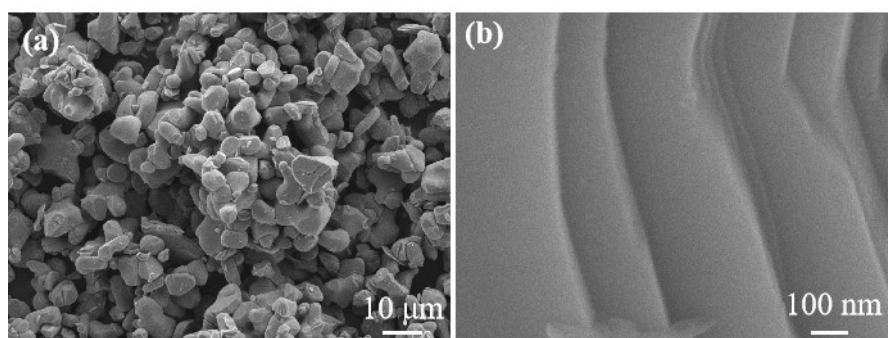


Fig. S1 (a) SEM image of the LiCoO_2 . (b) High-magnification SEM image of the LiCoO_2 .

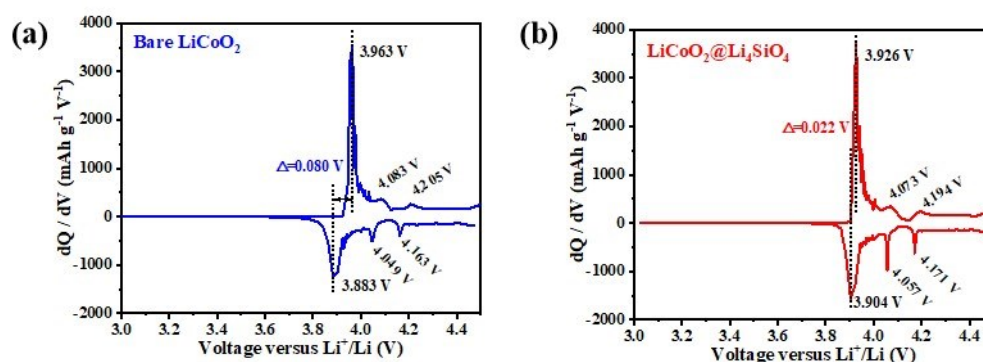


Fig. S2 dQ/dV profiles of the first cycle for the bare LiCoO_2 (a) and $\text{LiCoO}_2@Li_4SiO_4$ (b) electrodes.

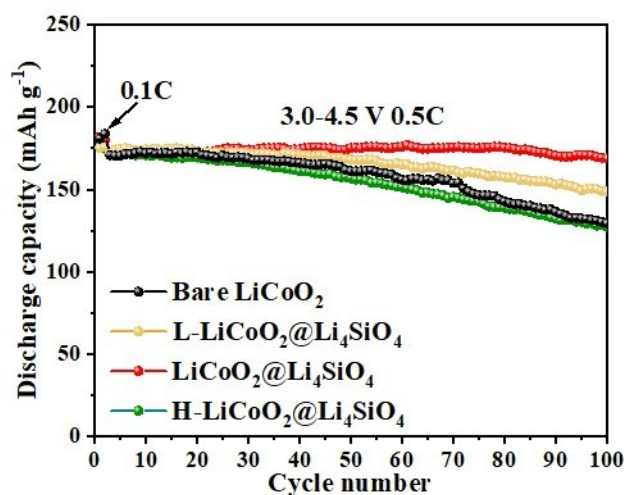


Fig. S3 Cycling performance of the bare LiCoO_2 , $\text{L-LiCoO}_2@Li_4SiO_4$, $\text{LiCoO}_2@Li_4SiO_4$, and $\text{H-LiCoO}_2@Li_4SiO_4$ electrodes at 0.5 C.

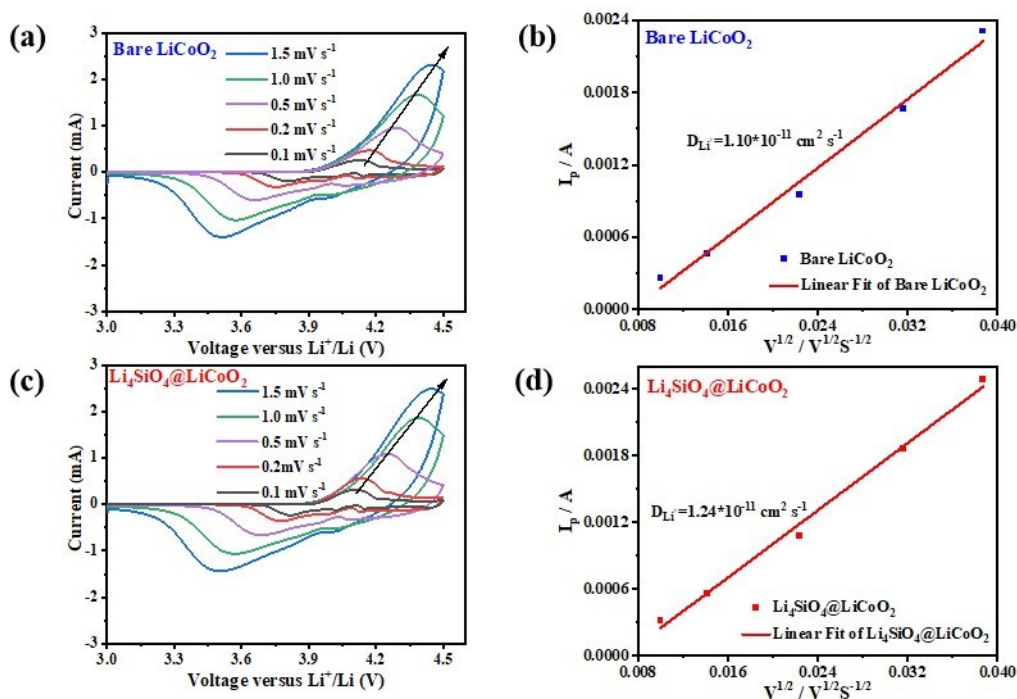


Fig. S4 Kinetic analysis of the electrochemical behavior of the bare LiCoO_2 and $\text{LiCoO}_2@Li_4SiO_4$ electrodes. CV curves at various scan rates ranging from 0.1–1.5 mV s^{-1} (a) and the relationship between I_p and $v^{1/2}$ (b) for the bare LiCoO_2 electrode. CV curves at various scan rates ranging from 0.1–1.5 mV s^{-1} (c) and the relationship between I_p and $v^{1/2}$ (d) for the $\text{LiCoO}_2@Li_4SiO_4$ electrode.

Table S1. Comparison of the electrochemical properties of the $\text{LiCoO}_2@Li_4SiO_4$ cathode with previously reported LiCoO_2 -based cathodes for LIBs.

LiCoO_2 -based	Cut-off	Current	Initial	Cycle	Capacity	Refs
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cathode	potentials (V vs. Li/Li ⁺)	density (1C = 274 mA g ⁻¹)	discharge capacity (mAh g ⁻¹)	number	retention	
TiO ₂ coated LiCoO ₂	3–4.5	1C	186	100	86.5%	[1]
MgAl ₂ O ₄ - modified LiCoO ₂	3–4.5	0.58C	184	70	96.8%	[2]
Li-Al-F modified LiCoO ₂	3–4.6	0.1C	208.6	100	89.1%	[3]
Li ₂ ZrO ₃ coated LiCoO ₂	3–4.5	3.65C	126.7	100	85.2%	[4]
Al-doped ZnO coated LiCoO ₂	2.75–4.5	0.36C	185	200	95%	[5]
Li ₃ PO ₄ coated LiCoO ₂	3–4.5	1C	185	100	80%	[6]
Al-doped ZnO coated LiCoO ₂	3–4.5	0.14C	174.7	100	97.4%	[7]
Li _{1.5} Al _{0.5} Ti _{1.5} (PO ₄) ₃ Coated LiCoO ₂	3–4.6	0.5C	214.6	100	88.3%	[8]
Li ₄ Ti ₅ O ₁₂ coated LiCoO ₂	3–4.5	0.2C	190	60	90%	[9]
LiCo _x Mn _{2-x} O ₄ coated LiCoO ₂	3–4.5	0.73C	174	300	82%	[10]
LiCoO ₂ @Li ₄ SiO ₄	3–4.5	0.5C	180.7(at 0.1C)	100	98.9%	This work
		2 C	180.7(at 0.1C)	500	82.2%	This work

References

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