

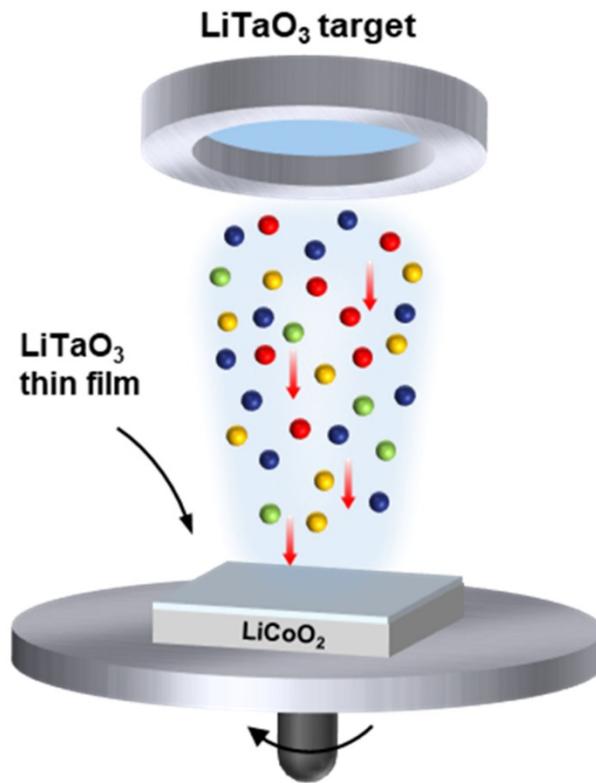
## Supporting Information

### **The improvement of high voltage performance of LiCoO<sub>2</sub> by coating LiTaO<sub>3</sub> via magnetron sputtering**

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**Fig S1.** Schematic diagram of magnetron sputtering.

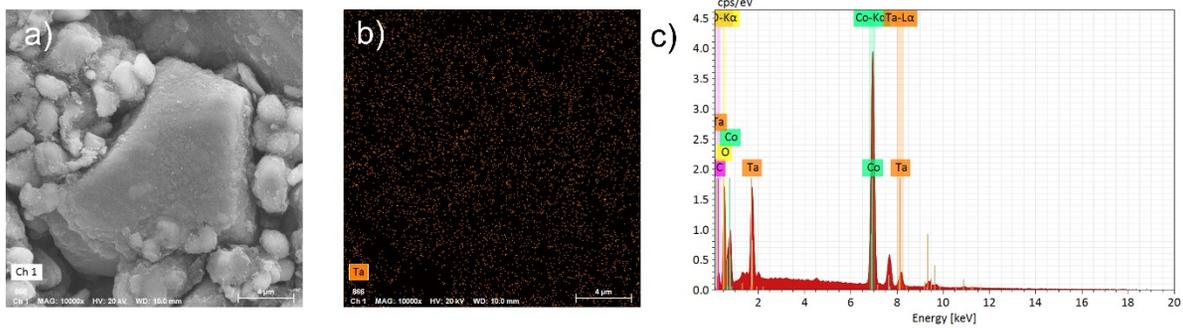
a)



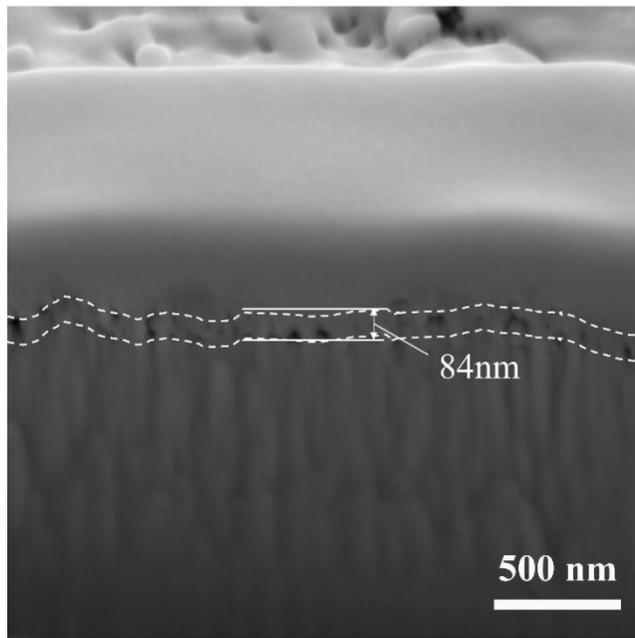
b)



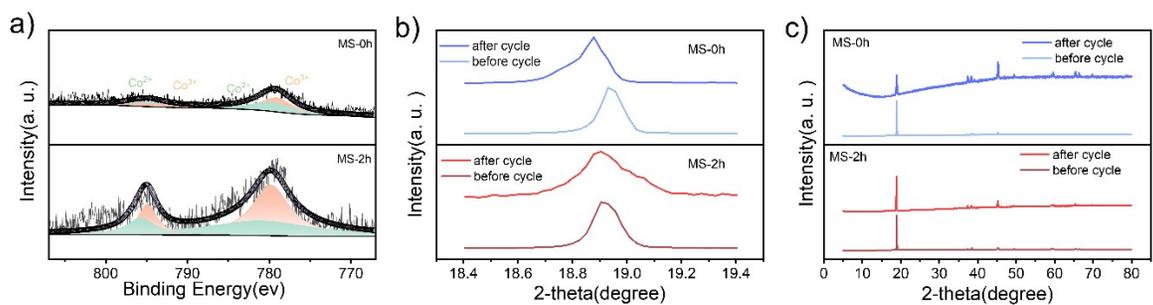
**Fig S2.** The picture of (a) MS-0h and (b) MS-2h electrode surface.



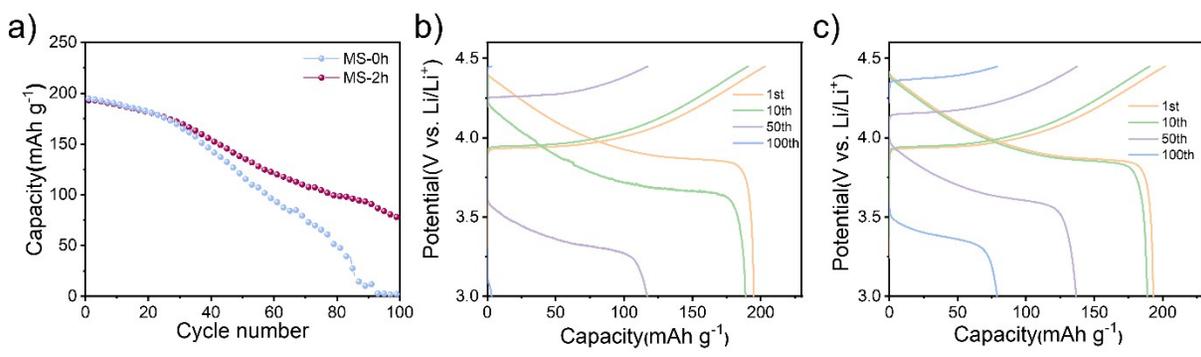
**Fig S3.** (a) SEM , (b) Ta mapping image and (c) EDS of MS-2h.



**Fig S4.** The image of FIB of MS-2h



**Fig. S5.** (a) XPS spectra of Co<sub>2</sub>p after 100 cycles under 4.6V at 0.5C, (b) (003) peak of the different electrodes, (c) The whole XRD pattern of the different electrodes.



**Fig. S6.** (a) Cycle capacity of MS-0h and MS-2h at 50°C; GCD curve of (b) MS-0h and (c) MS-2h.

**Table S1.**  $R_s$ ,  $R_{ct}$  and  $R_{CEI}$  of MS-0h and MS-2h before and after 100 cycles.

		$R_s$	$R_{ct}$	$R_{sf}$
Before cycle	MS-0h	2.904	191.3	
	MS-2h	2.739	271.3	
After cycle	MS-0h	2.877	113.0	6.0
	MS-2h	2.383	50.0	4.6