# Electronic Supplementary Information

## $TiO_2$ modified two-dimensional composite of nitrogen-doped molybdenum trioxide nanosheets as high performance anode for lithium-ion batteries

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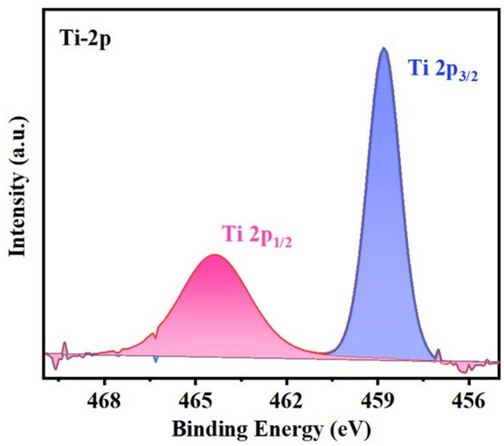


**Fig. S1.** High-resolution XPS spectra of Ti-2p.

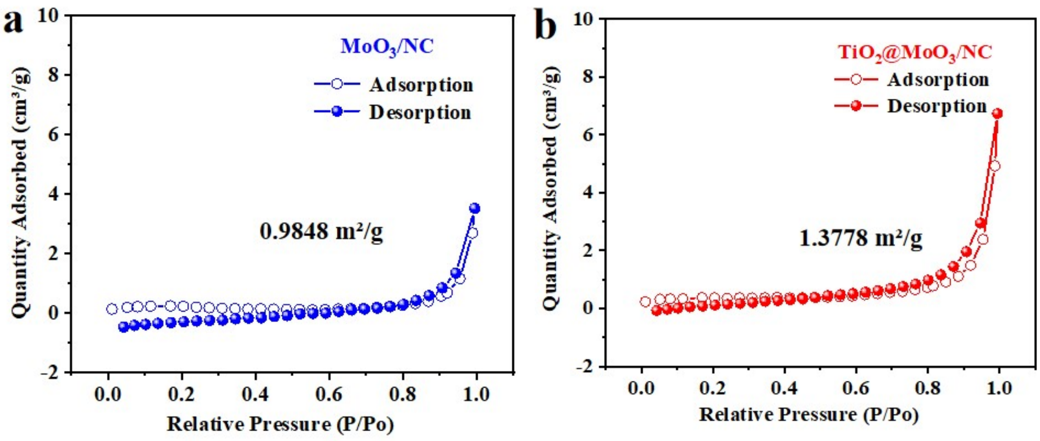


**Fig. S2.** The BET surface area of $MoO_3$/NC and $TiO_2$@$MoO_3$/NC.

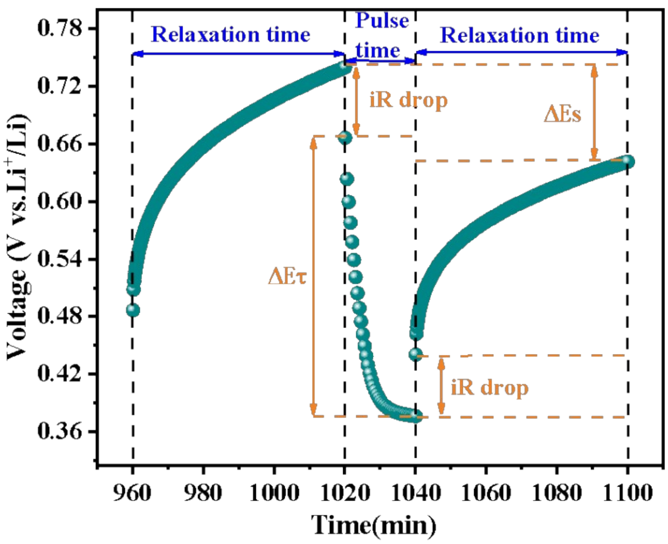


**Fig. S3.** E vs. t curves of $TiO_2$@$MoO_3$/NC electrode for a single GITT during discharge process.

The GITT measurement for the initial cycle of $TiO_2$@$MoO_3$/NC composite was carried out with a current pulse of 0.1 A $g^{-1}$ for 20 min and a relaxation time of 20 min in the voltage range of 0.01-3.0 V. The lithiation diffision coeffi通eient ($D^{GITT}$) can be calculated using the following equation:

$$D^{GITT} = \left(4L^2 / \pi\tau\right) \bullet \left(\Delta Es / \Delta E\tau\right) \qquad (1)$$

Where L (cm) represents the lithium ion diffusion length, which can be equal to the thickness of the electrodes for compact electrode,τ is the constant current pulse time (s), and ΔEs (V) presents the difference in the steady state potential of the step at plateau, while ΔEτ (V) is the total change of the voltage during a constant current pulse time.

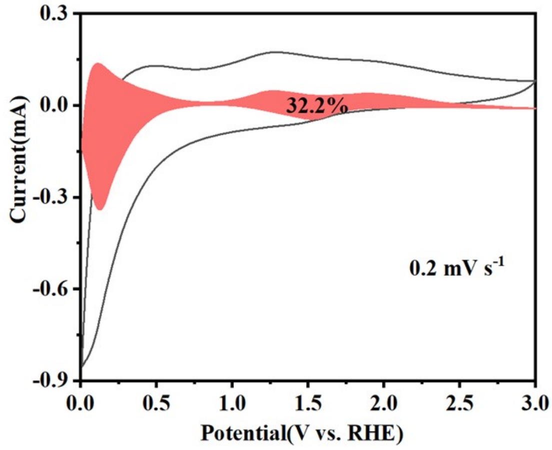


**Fig. S4.** $TiO_2$@$MoO_3$/NC of the capacitive contribution at 0.2 mV $s^{-1}$.

**Table S1 Comparison of LIBs performance of several reported anode materials**

| Materials | Rate performance | | Cyclic performance | | | Ref. |
|---|---|---|---|---|---|---|
| | Current density (A $g^{-1}$) | Capacity (mAh $g^{-1}$) | Current density (A $g^{-1}$) | cycle | Capacity (mAh $g^{-1}$) | |
| $TiO_2$@$MoO_3$/NC | 0.05 | 419 | 1 | 600 | 517 | This work |
| $MoO_3$@$MoS_2$ | 0.7 | 278 | 1 | 100 | 564 | [1] |
| α-$MoO_3$/CNTs | | | 1 | 250 | 270 | [2] |
| $NiMoO_4$/α-$MoO_3$ | | | 1 | 50 | 324 | [3] |
| $MoO_2$/carbon | | | 1 | 60 | 675 | [4] |
| h-$MoO_3$ | | | 1 | 100 | 619 | [5] |

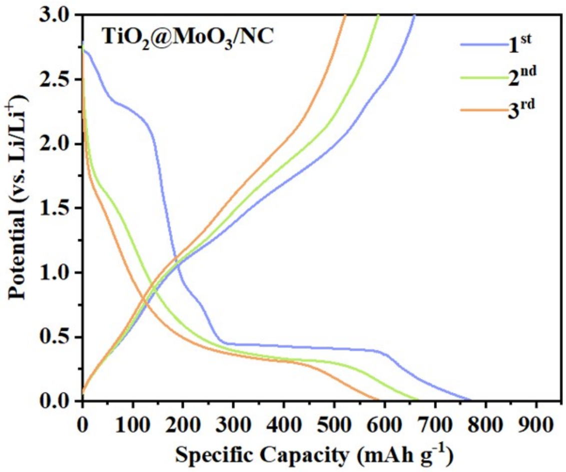


**Fig. S5.** The galvanostatic charge/ discharge curves of $TiO_2$@$MoO_3$/NC.

**Table S2 Electrical conductivity of $MoO_3$/NC and $TiO_2$@$MoO_3$/NC samples**

| Materials | Electrical conductivity |
|---|---|
| $MoO_3$/NC | 0.05 μs $cm^{-1}$ |
| $TiO_2$@$MoO_3$/NC | 128.72 ms $cm^{-1}$ |

（Test instrument model：HIOKI BT3562-01）

# Reference


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