Supplementary Information

Non-Layered Ti$_2$N Synthesized by Plasma Process for the Anodes of Lithium Ion Batteries

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Estimation of Work Functions

$\varphi_d$ : The average difference of work function between Au and the probe.
$\varphi_{Au}$ : The work function of Au.
$\varphi_p$ : The work function of the probe.
$\varphi_{m}$ : The average difference of work function between Ti$_2$N and the probe.
$\varphi_{Ti_2N}$ : The work function of Ti$_2$N

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\varphi_d = \varphi_p - \varphi_{Au} \quad \text{(S1)}
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\[
\varphi_m = \varphi_p - \varphi_{Ti_2N} \quad \text{(S2)}
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The Au is first analyzed by KPFM to obtain the value of $\varphi_d$, thus the $\varphi_d$ can be derived by using Eq. S1 since the $\varphi_{Au}$ is already known. Then the Ti$_2$N samples can be analyzed to acquire the values of $\varphi_m$. Finally, the values of $\varphi_{Ti_2N}$ can be derived by using Eq. S2.
Fig. S1 (a) The cross-sectional TEM image of the $\varepsilon$-Ti$_2$N obtained by the process with the plasma exposure time of 45 minutes. (b) The cross-sectional TEM image of the $\varepsilon$-Ti$_2$N obtained by the process with the plasma exposure time of 60 minutes.