Supplementary Information

CNT–MXene ultralight membranes: fabrication, surface nano/microstructure, 2D–3D stacking architecture, ion-transport mechanism, and potential application as interlayers for Li–O_2 batteries

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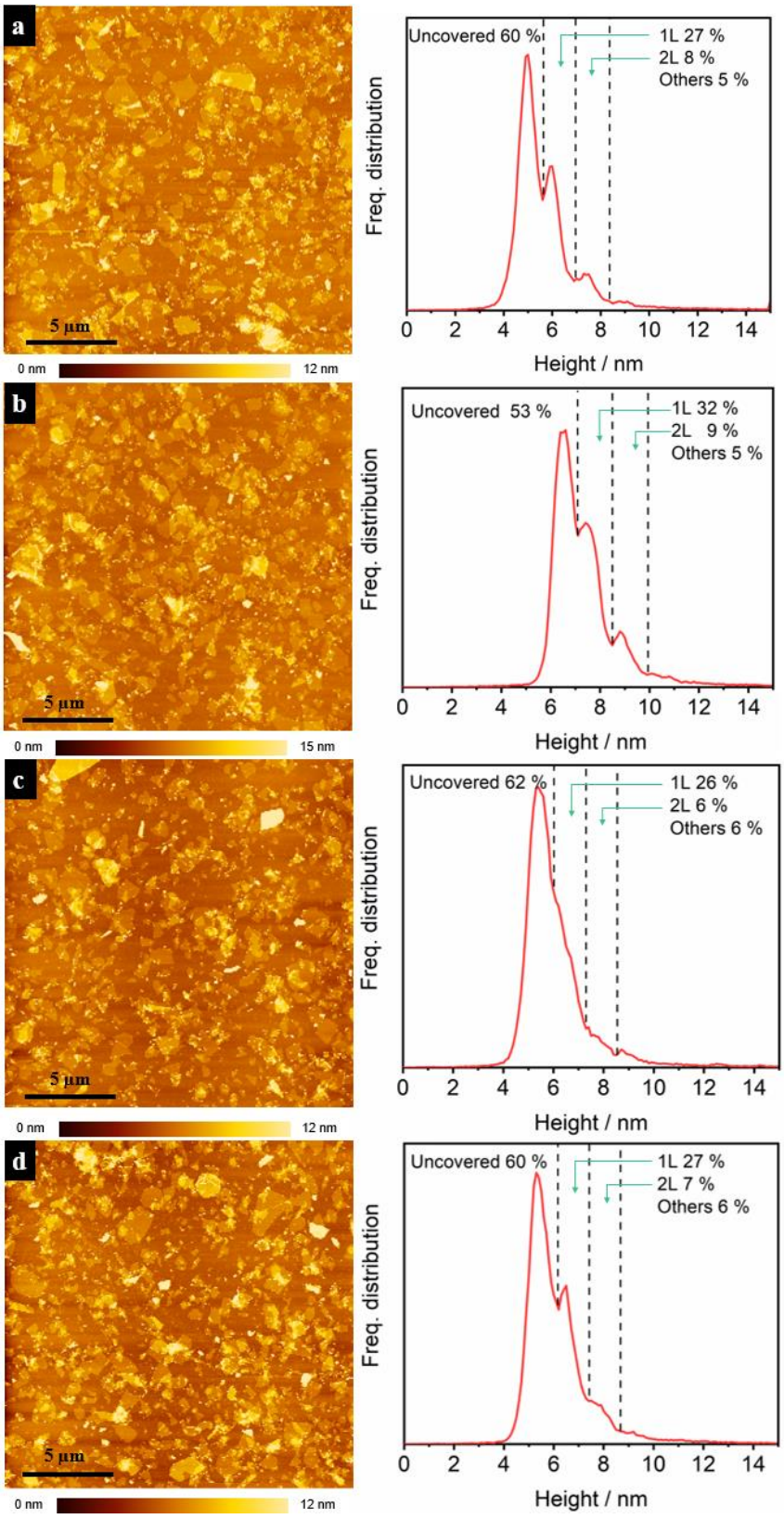

Figure S1. a-d) AFM images and their corresponding histogram profiles of as-prepared MXene nanosheets used for height histogram analysis. The percentage was obtained from the cumulative frequency of different heights. "Others" indicates nanoparticles and few-layer MXenes in the dispersion (see **Table S1**).

Table S1. The proportion of different MXene nanosheets based on the number of their layers as revealed by the AFM analysis in **Figure S1**.

Image No.	1-L / %	2-L / %	Few-layer / %	1-L MXenes in the as-prepared dispersion / %
a	27	8	5	67
b	32	9	5	69
c	26	6	6	68
d	27	7	6	67

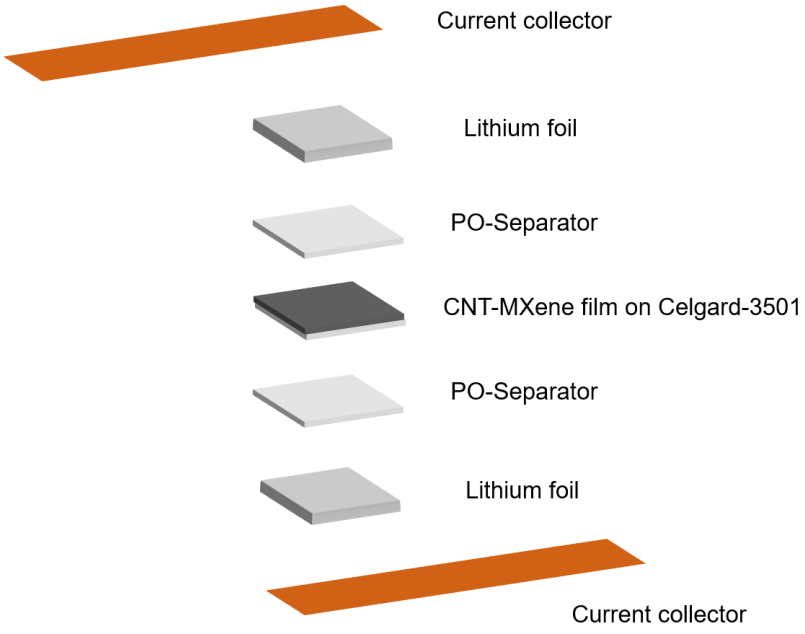

Figure S2. Schematic illustration of the Li/Li symmetric cell structure.

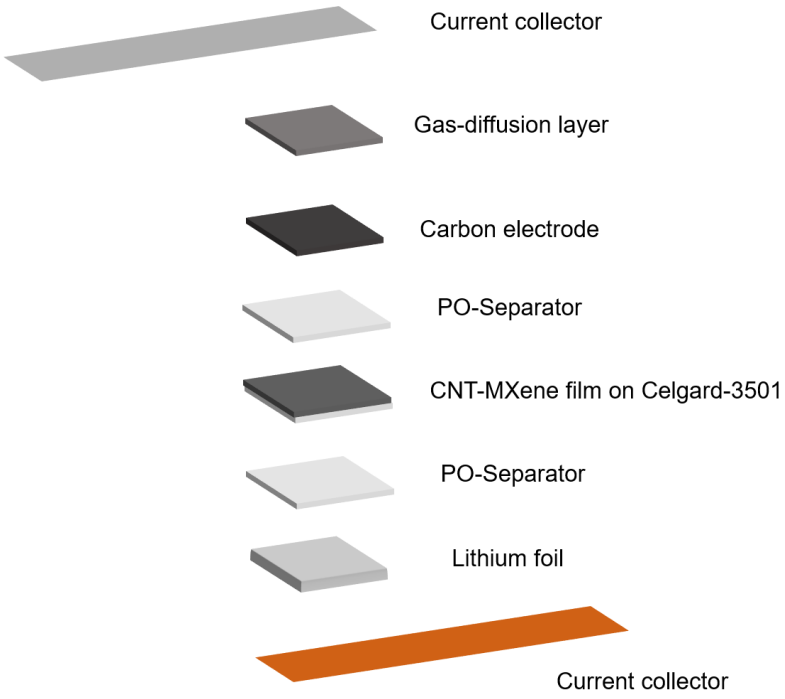

Figure S3. Schematic illustration of the Li–O_2 battery cell structure.