Multifunctional MXene additive for enhancing mechanical

and electrochemical performances of LiNi_{0.8}Co_{0.1}Mn_{0.1}O₂

cathode in lithium ion battery

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Fig. S1 SEM images for pristine LiNi_{0.8}Co_{0.1}Mn_{0.1}O₂ (NCM811).



Fig. S2 a~b) EDX spectrum analysis and c~d) AFM images of the few-layer/rod-like MXene.

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Fig. S3 SEM images for NCM811 cathode with different MXene additive.



Fig. S4 SEM images of the a~b) fresh, c~d) activated and e~f) cycled 0-MXene electrodes.



Fig. S5 SEM images of the $a\sim b$) fresh, $c\sim d$) activated and $e\sim f$) cycled 2.5-MXene electrodes.



Fig. S6 Differential charge capacity curves derived from 0.5 C cycling for a) 0-MXene and b) 2.5-MXene with magnified views related to the H1 \leftrightarrow M, M \leftrightarrow H2 and H2 \leftrightarrow H3 phase transitions during the c) discharge and d) charge process.