# Supporting Information

**Molybdenum dichalcogenide cathodes for aluminium-ion batteries**

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Figure S1: Galvanostatic charge/discharge profile of the first three cycles of a) , b)  and c) MoSSe at a current rate of 40 mA  in a two-electrode setup.



Figure S2: a) Galvanostatic charge/discharge curves of an Al/ blank Mo cell using a two-electrode setup at a current rate of 40 mA . The cells failed to achieve any significant specific capacities during both charge and discharge. b) Blank Mo foil displayed CE at 40%. This confirmed that when acting as the current collector, molybdenum did not contribute any capacity of its own..



Figure S3: SEM images of pristine a)  and b) ; and cycled c)  and d) . SEM images of e) pristine and f) cycled MoSSe.  and  clearly have a layered structure, while MoSSe lacks a long-range order.



Figure S4: Energy dispersive X-ray spectroscopy (EDXS) map of pristine MoSSe showing equal distribution of Mo, S and Se.



Figure S5: EDX spectra of pristine MoSSe showing peaks for Mo, S and Se.