## **Supplementary Information**

## Copper incorporated $Cu_x Mo_6 S_8$ ( $x \ge 1$ ) Chevrel phase cathode materials synthesized by chemical intercalation process for rechargeable magnesium batteries

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Fig. S1 EDS elemental mapping of product stored for 36 h at 80 °C: (a) SEM image, (b) Mo  $L\alpha 1$ , (c) S K $\alpha 1$ , and (d) Cu K $\alpha 1$ .



**Fig. S2** FESEM images and PSA results for (a) powder before leaching and (b) powder after being fully leached.



**Fig. S3** Voltage profiles of unleached powder ( $Cu_2Mo_6S_8$ ) at a constant current of 6 mA g<sup>-1</sup> (0.05C) during first discharge/charge and subsequent discharge.