

Electronic Supplementary Information (ESI)

Suppressing Effect of Lithium Dendritic Growth by Addition of Magnesium bis(trifluorosulfonyl)amide

[†] Department of Materials Chemistry, Faculty of Engineering, Shinshu University

[‡] Institute of Carbon Science and Technology, Faculty of Engineering, Shinshu University

Masahiro Shimizu^{*ab}, Makoto Umeki^a, Susumu Arai^{*ab}

Dr. Masahiro Shimizu

E-mail: shimizu@shinshu-u.ac.jp

Tel: +81-26-269-5627; Fax: +81-26-269-5627

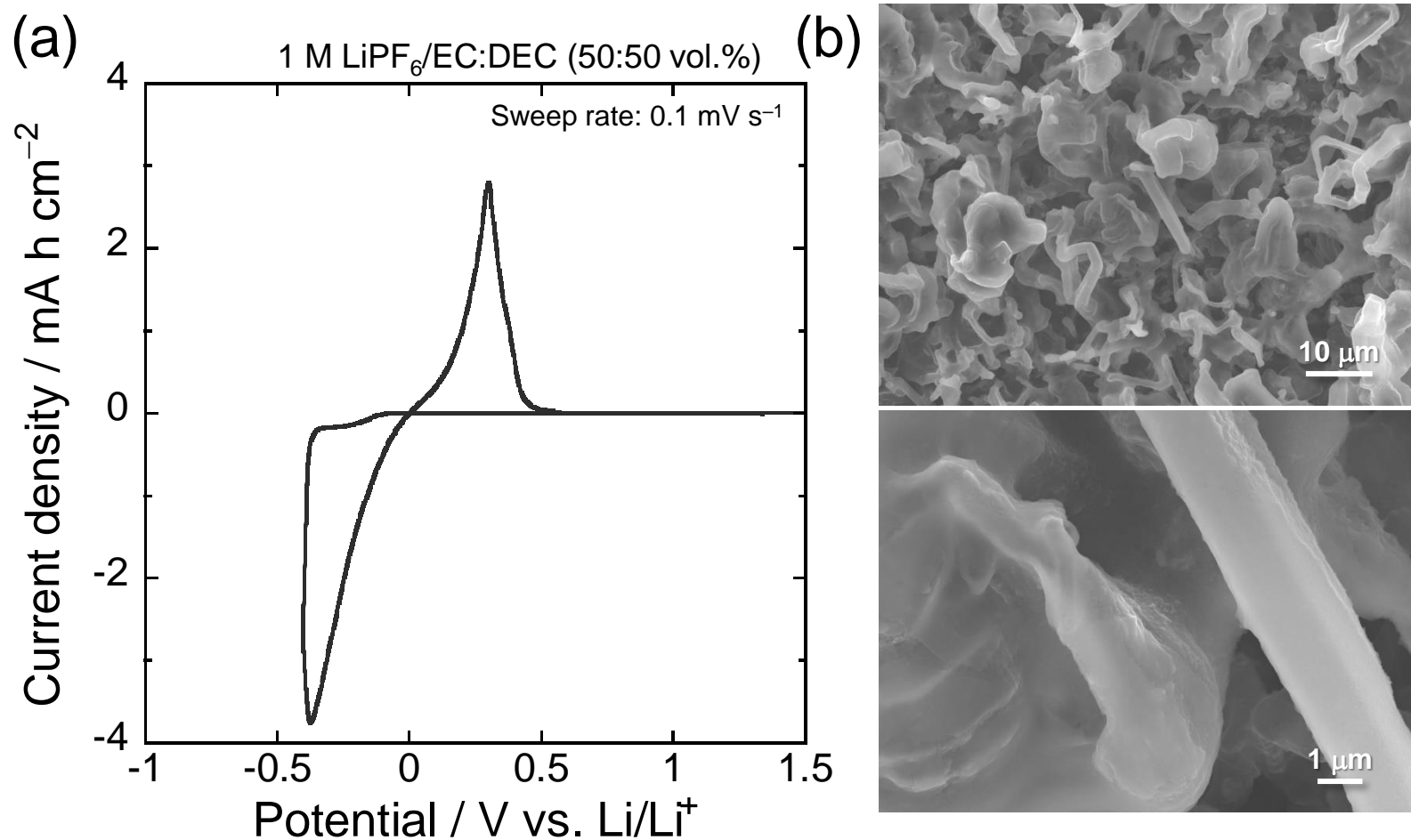


Figure S1. (a) CV profile of Li-deposition/dissolution behavior on a Cu substrate in a commercial electrolyte of 1 M LiPF₆/EC:DEC (50:50 vol.%) at a sweep rate of 0.1 mV s⁻¹. (b) FE-SEM images of deposited Li at a constant potential of -0.4 V vs. Li/Li⁺ for 10 h.

1.0 M LiTFSA/G3 (Mg-salt free)

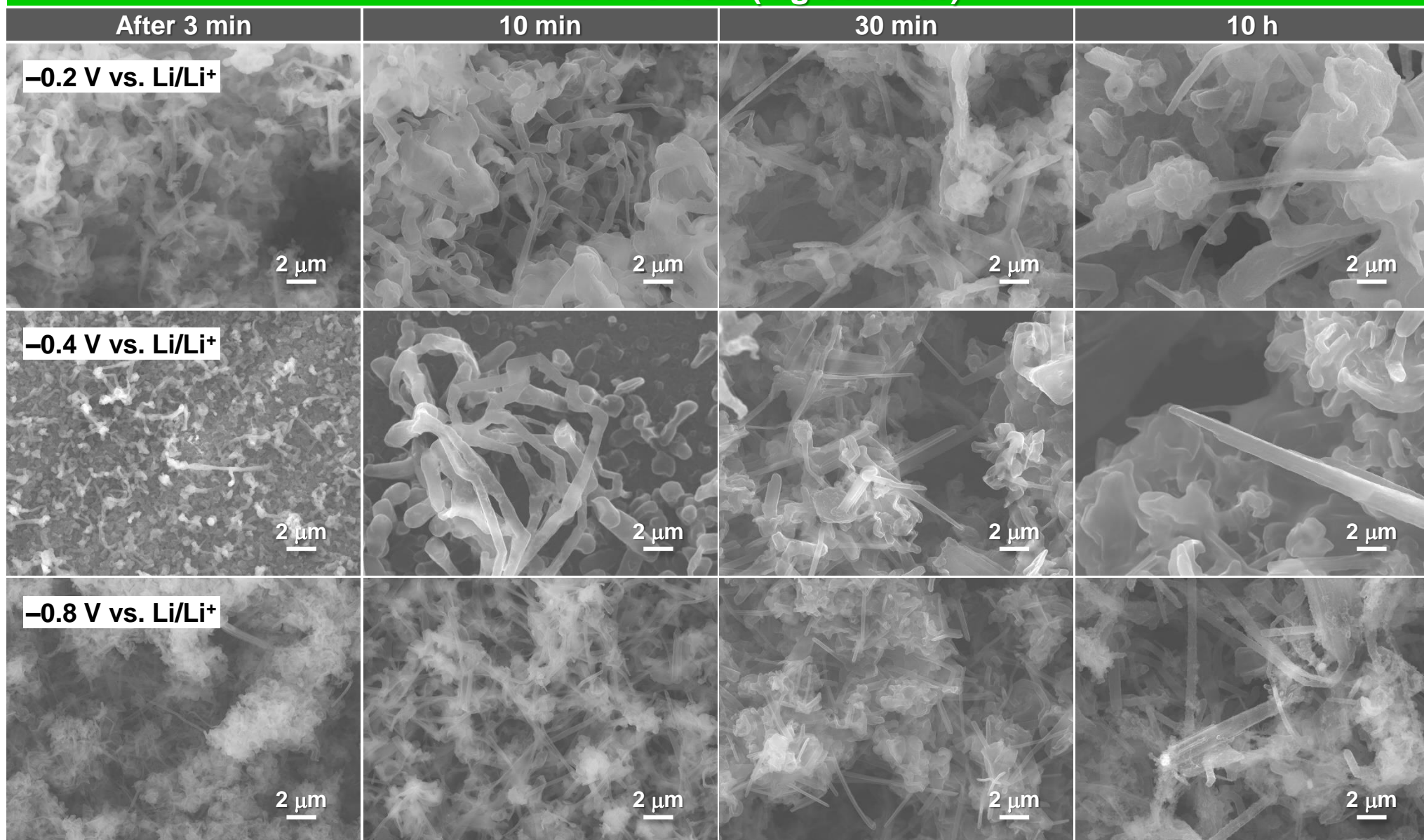


Figure S2. Enlarged views of FE-SEM images for deposits obtained from 1.0 M LiTFSA/G3 at various potentials: -0.2 V, -0.4 V, and -0.8 V vs. Li/Li⁺.

0.9 M LiTFSA + 0.1 M Mg(TFSA)₂/G3

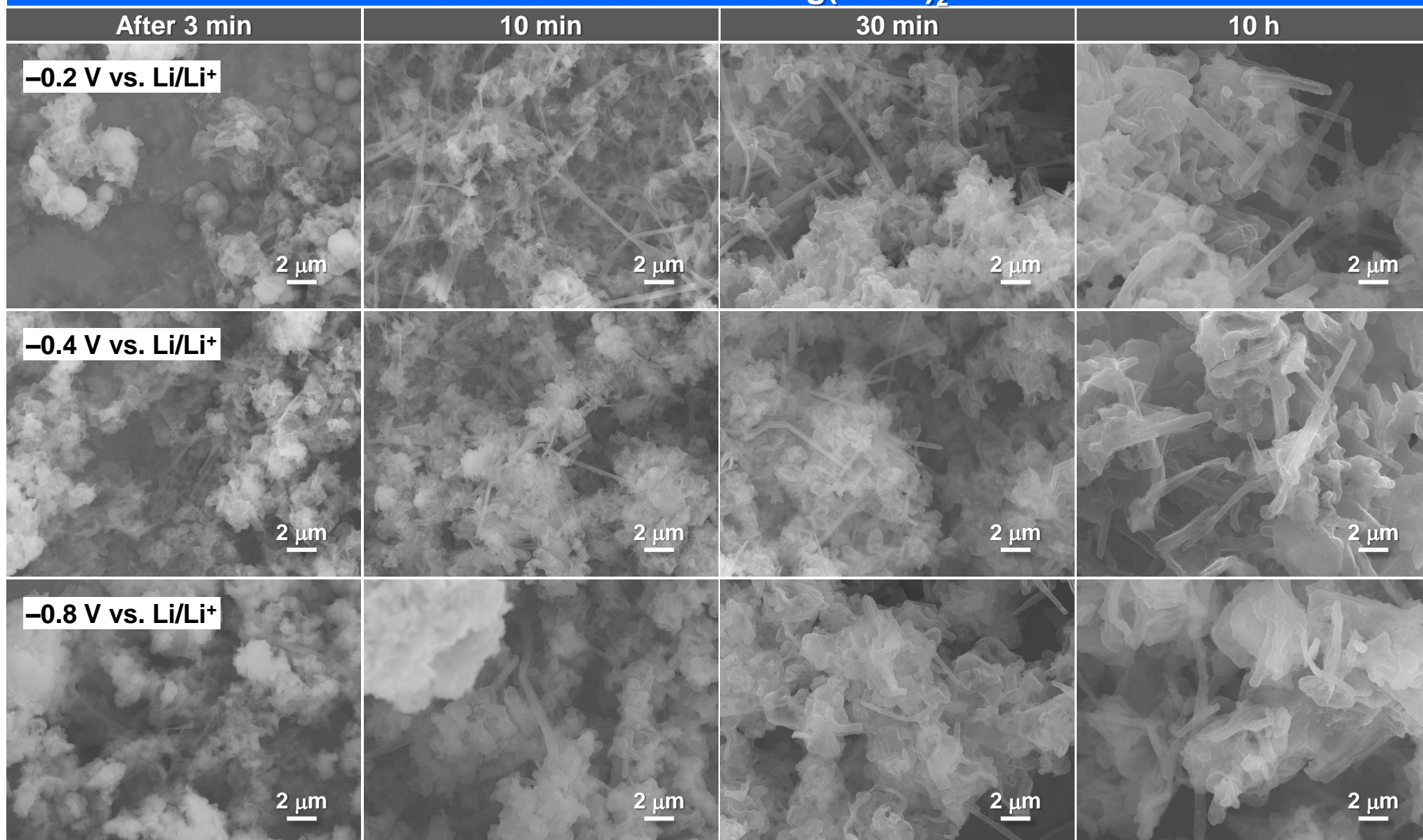


Figure S3. Enlarged views of FE-SEM images for deposits obtained from 0.1 M Mg(TFSA)₂ + 0.9 M LiTFSA/G3: at various potentials vs. Li/Li⁺.

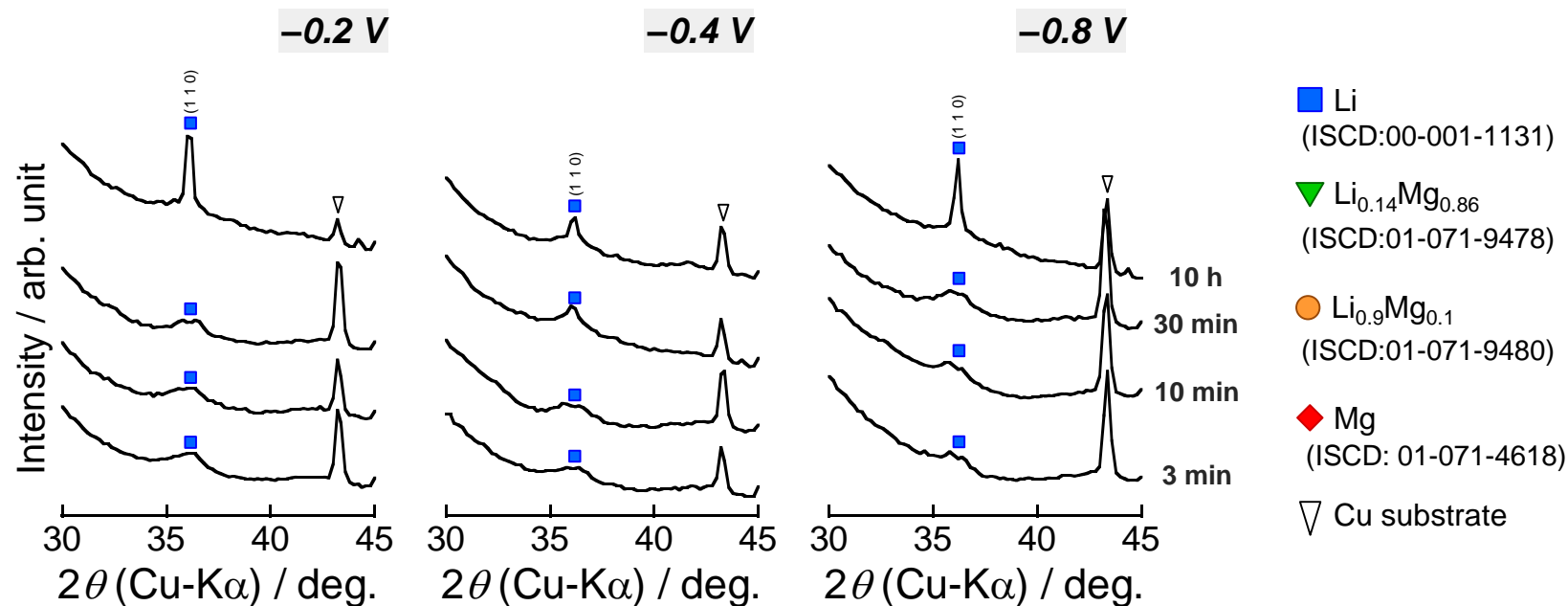


Figure S4. XRD patterns of deposits electrochemically grown on a Cu substrate in electrolytes of 0.1 M $\text{Mg}(\text{TFSA})_2$ + 0.9 M LiTFSA/G3 at each time under various constant potential.

0.5 M LiTFSA + 0.5 M Mg(TFSA)₂/G3

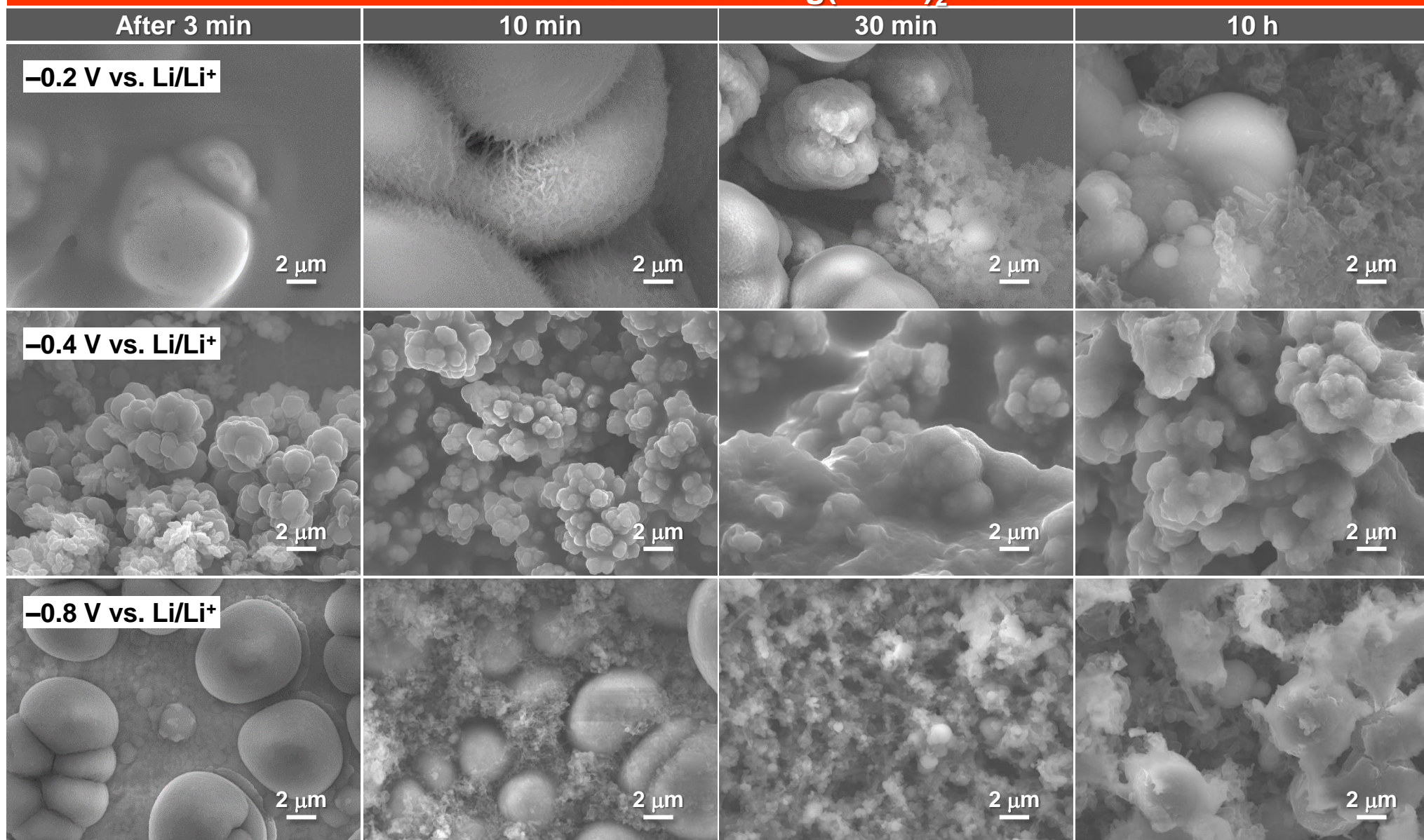


Figure S5. Enlarged views of FE-SEM images for deposits obtained from 0.5 M Mg(TFSA)₂ + 0.5 M LiTFSA/G3 at various potentials vs. Li/Li⁺.

0.5 M LiTfSA + 0.5 M Mg(TfSA)₂/G3 (Low Magnification)

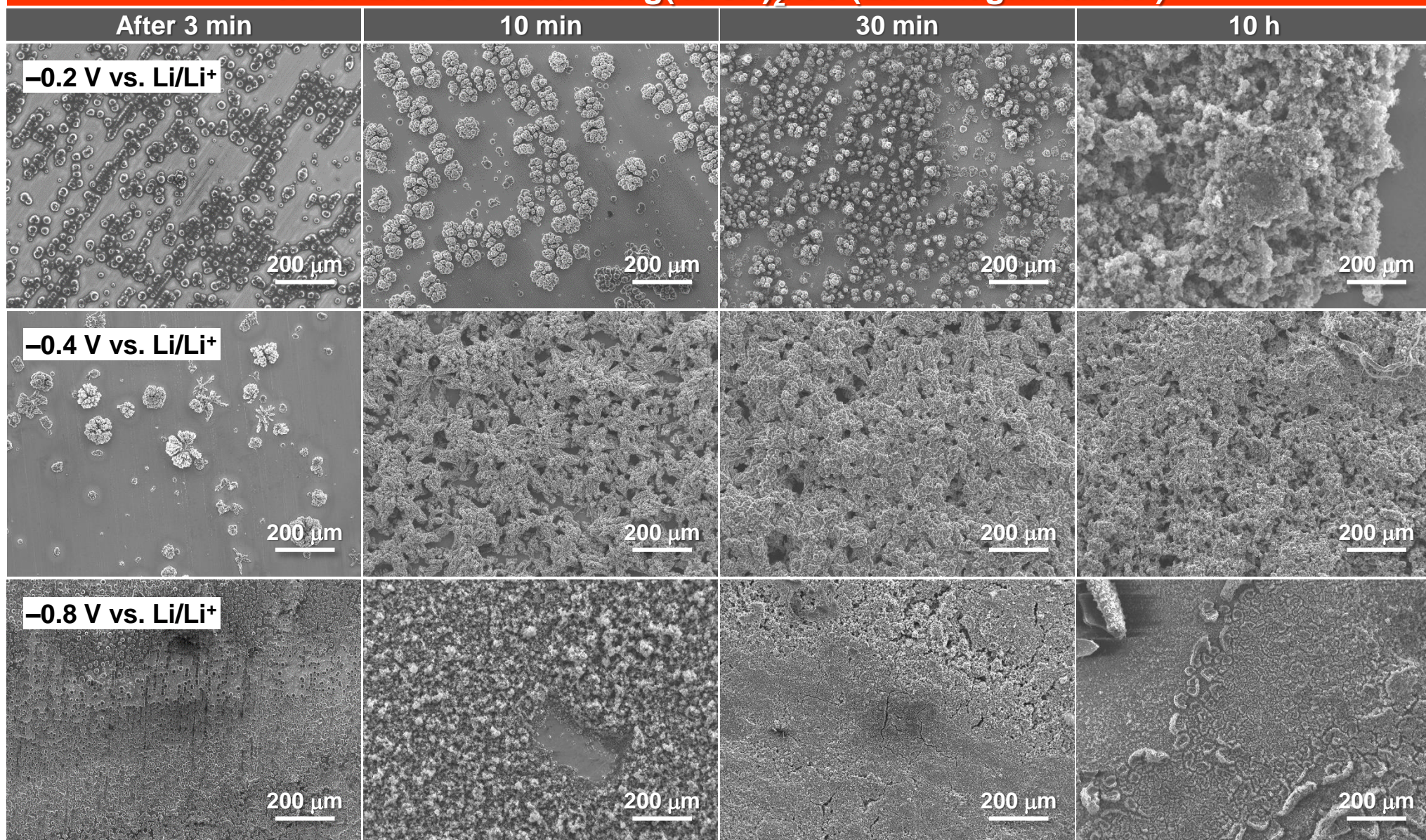
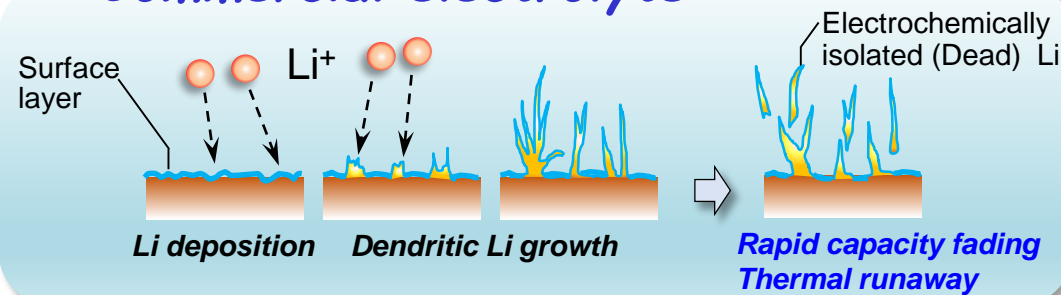


Figure S6. FE-SEM images for deposits obtained from 0.5 M Mg(TfSA)₂ + 0.5 M LiTfSA/G3 at various potentials vs. Li/Li⁺. Magnification: $\times 100$.

Graphical abstract

Commercial electrolyte



Electrolyte containing Mg-salt

