Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting information

Preparation and Electrochemical Properties of Li_2MoO_3/C Composites for Rechargeable Li-ion Batteries

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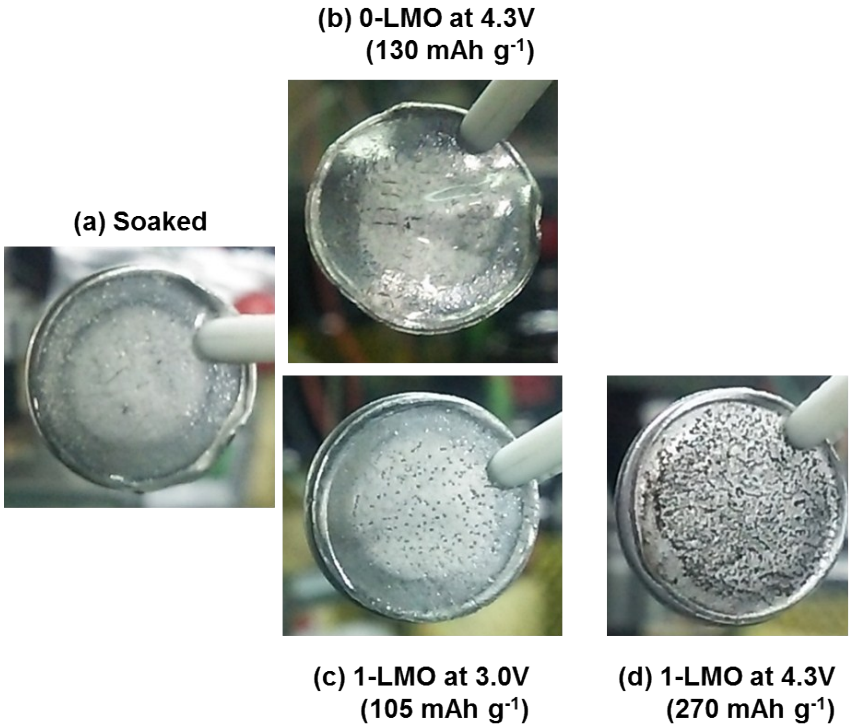

Fig. S1. Photos of Li metals, used as counter electrode in 2032-type Li cell, (a) soaked in the electrolyte, and (b) tested with 0-LMO charged to 4.3 V (130 mAh g^{-1}), (c) 1-LMO charged to 3.0 V (105 mAh g^{-1}), and (d) 1-LMO charged to 4.3 V (270 mAh g^{-1}) during 1st charging process. In (a), (b), and (c), clean surface and no color change were observed. In (d), many black spots was seen, which implies deposition of molybdenum-containing compounds on the surface as molybdenum was detected for a separator by EDX in Fig. S2. Mo dissolution is severe above 3.0 V corresponding to 105 mAh g^{-1} for 1-LMO.

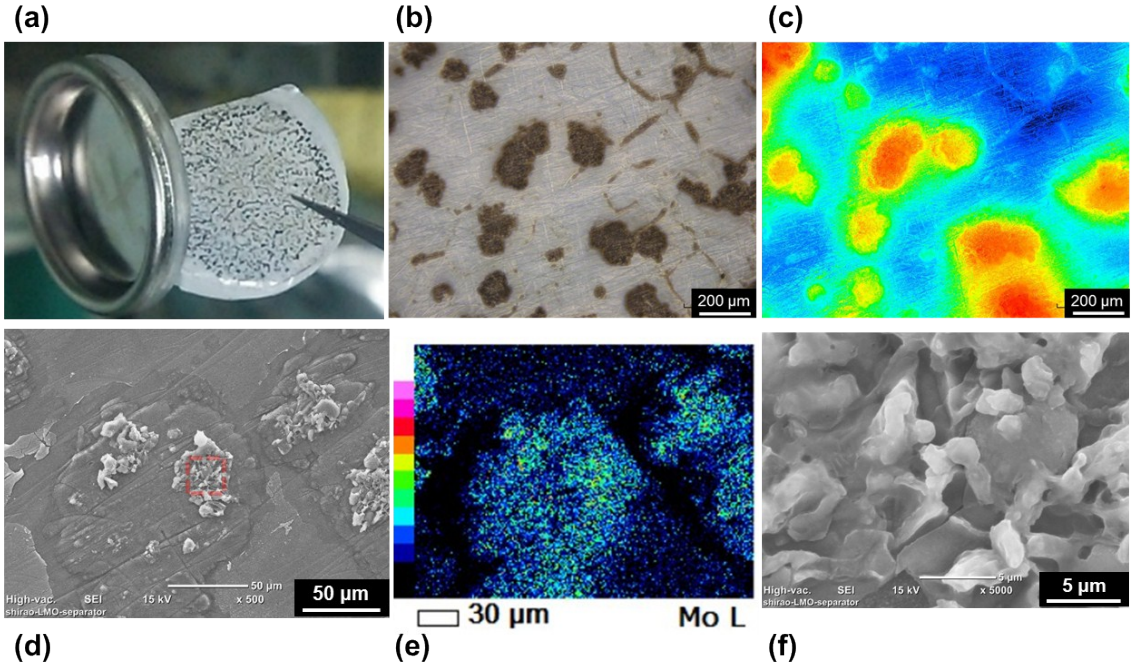

Fig. S2. (a) Picture of a separator taken from the Li electrode side in 1-LMO/Li cell charged to 4.3 V. Many black spots on the separator are observed as well as Li metal in Fig. S1d. (b) Image of laser microscopy and (c) color map of height gradient of the separator. Black spots correspond to thick area showing something accumulated on the surface. (d) SEM image and (e) EDX map of Mo L-edge of the separator. The separator is carefully washed by DMC and the Li electrode side of the separator is used for the SEM and EDX measurement. Some surface deposits are observed in the SEM image. EDX confirms that molybdenum exists on the separator and relatively strong Mo signal is found from the deposits. (f) SEM image with large magnification for the deposits. Figs. S2 and S1 prove that Mo dissolution occurs during charge and Mo containing deposits are accumulated on the separator and Li metal, which are seen as black spots.