Electronic Supplementary Material (ESI) for Nanoscale.

Supporting Information

A hierarchical layering design for stable, self-restrained and high volumetric binder-free lithium Storage

Xinghao Zhang,[‡a,b] Denghui Wang,[‡a,c] Siyuan Zhang,[a,c] Xianglong Li[*a,c] and Linjie Zhi[*a,c]

Fig. S1-S4

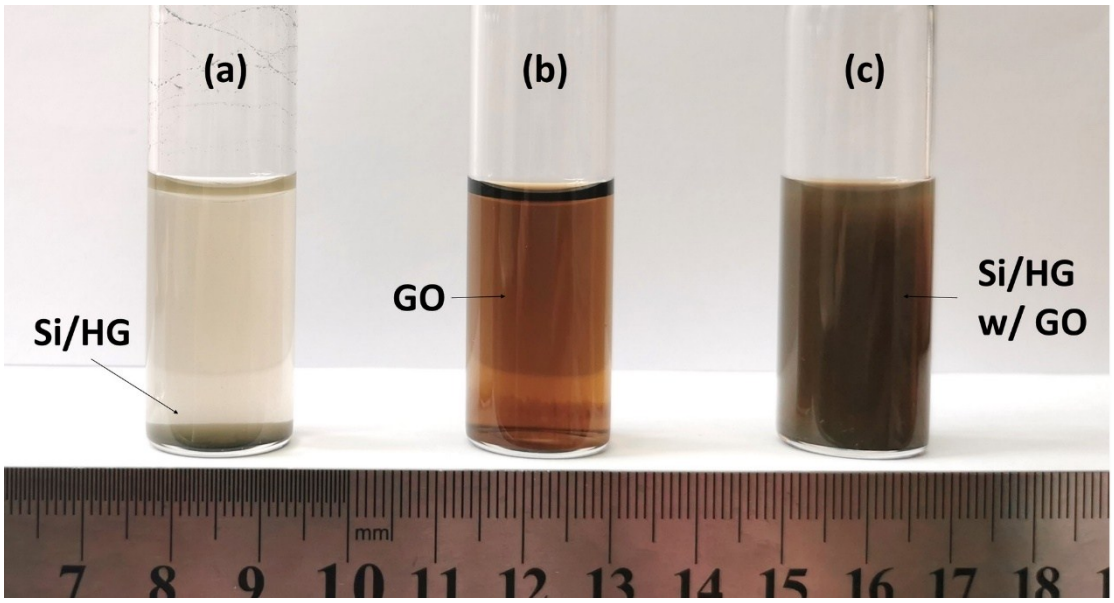

Fig. S1 Photographs of the dispersions of Si/HG, GO, and Si/HG with GO.

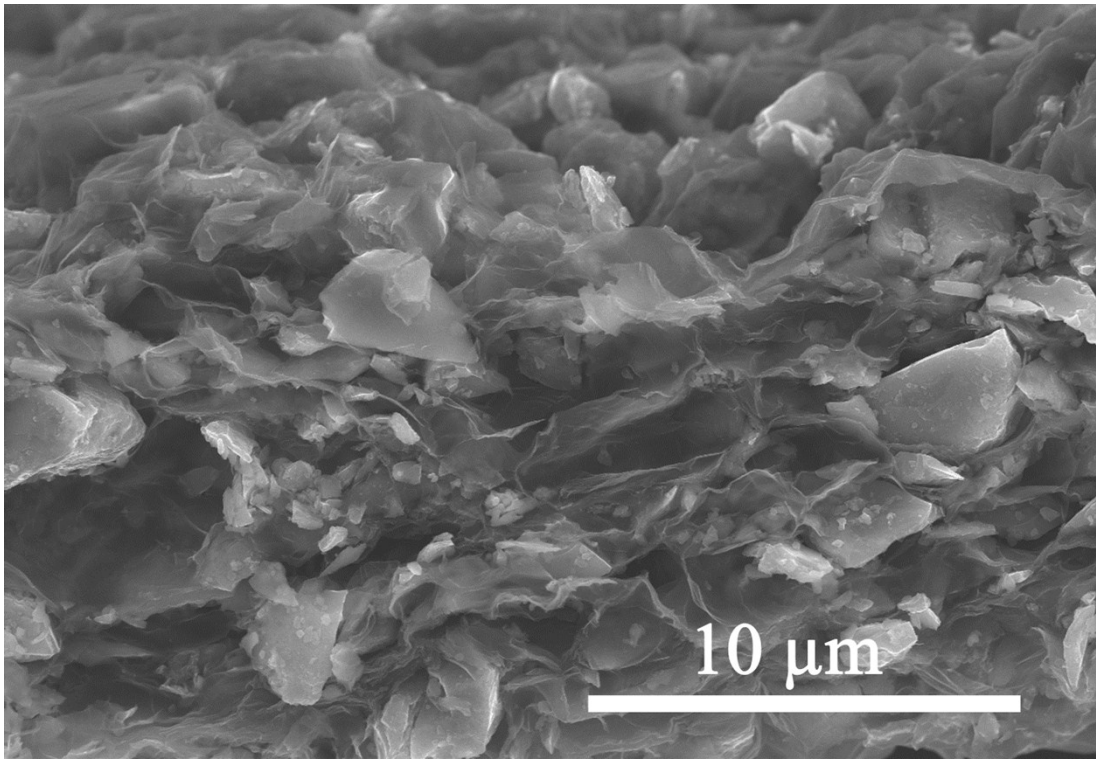

Fig. S2 Cross-sectional SEM image of m-Si/LG.

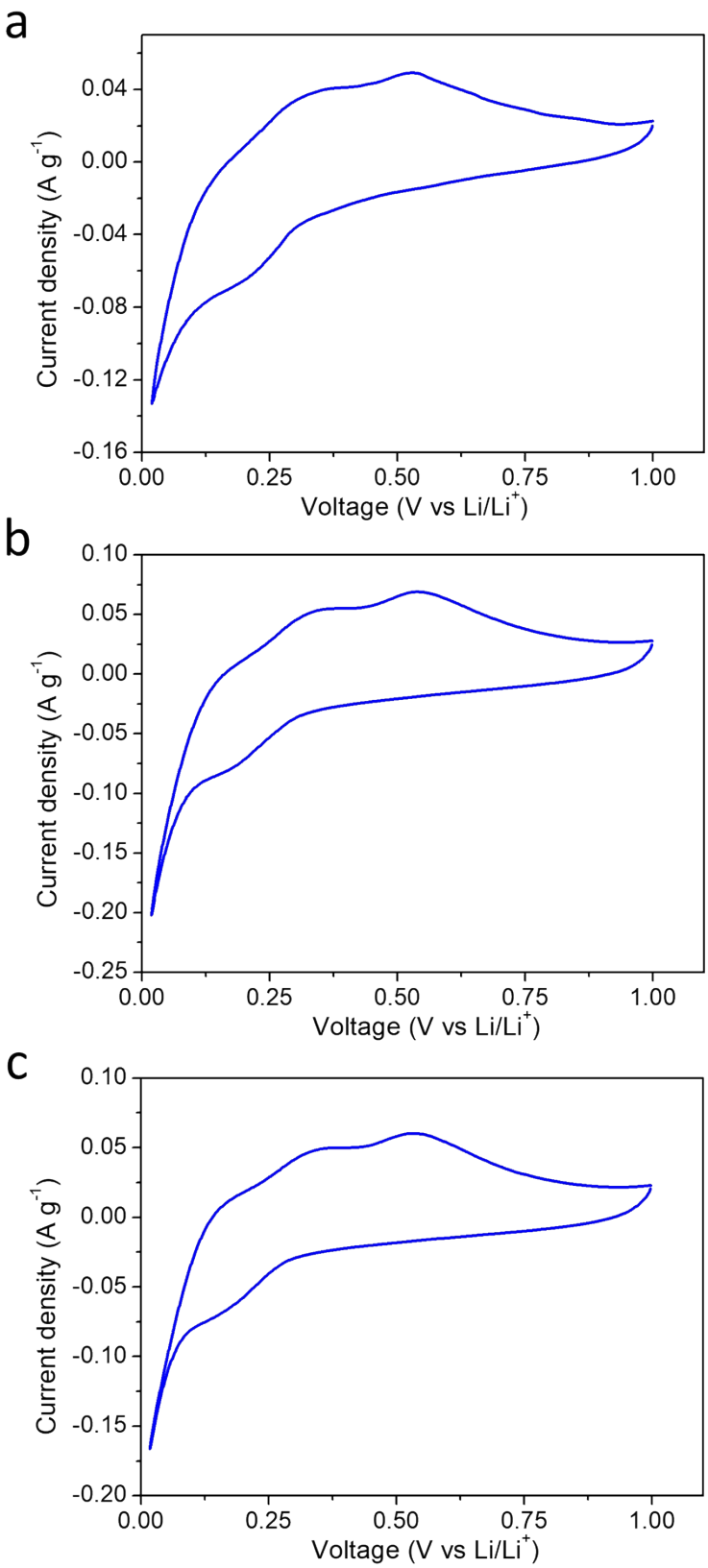

Fig. S3 Typical CV curves of a) Si/HG@LG, b) Si/LG, and c) m-Si/LG. All the curves show similar cathodic and anodic peaks to those for previously reported Si anodes.

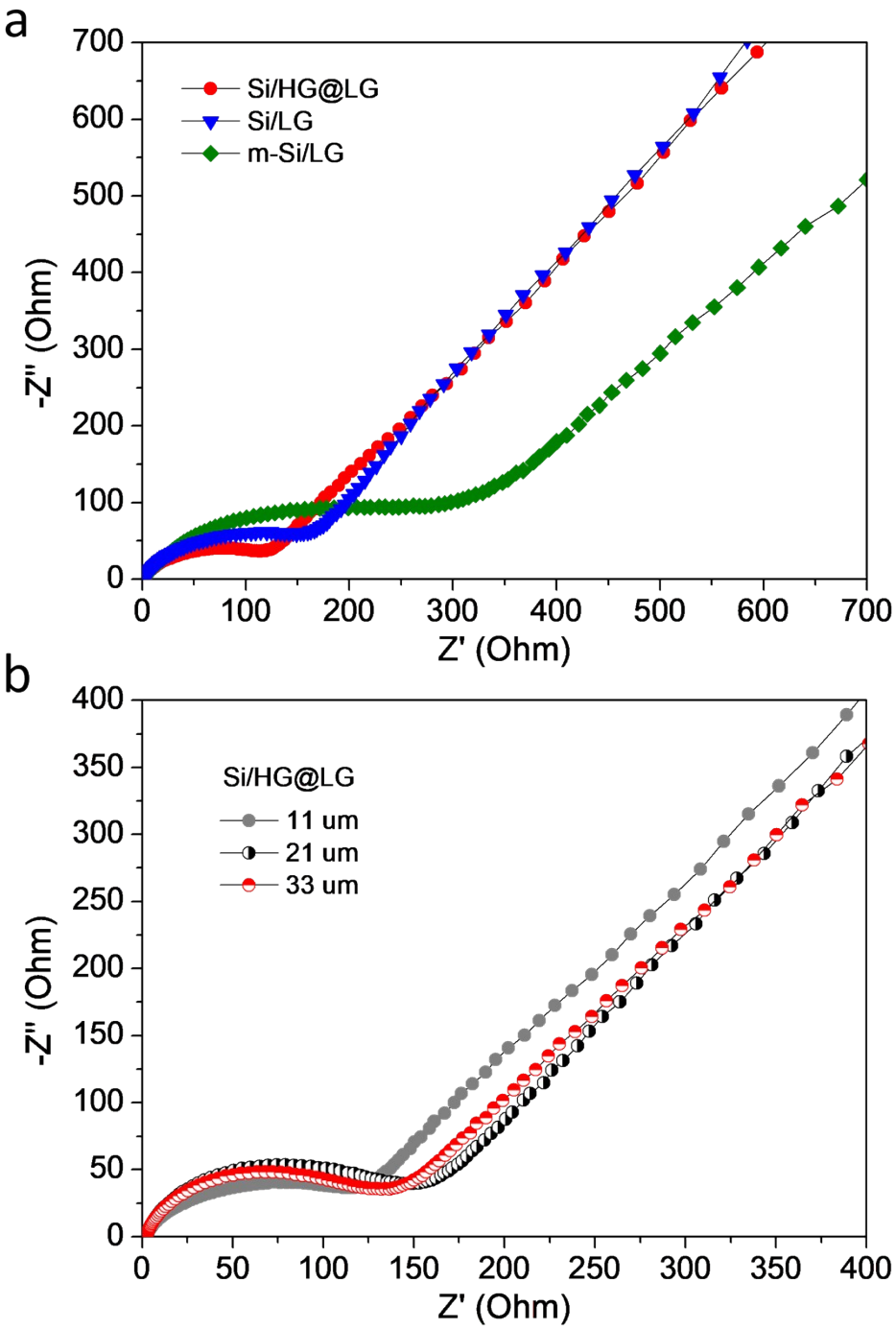

Fig. S4 Nyquist plots obtained from EIS measurements of a) Si/HG@LG, Si/LG as well as m-Si/LG with similar thicknesses, and b) Si/HG@LG with annotated electrode thicknesses. All the plots are composed of a depressed semicircle in the higher frequency region and an inclined line in the lower frequency region, consistent with that for silicon anodes. The inclined line corresponds to the lithium-ion diffusion impedance, and the depressed semicircle mainly consists of the interfacial charge transfer impedance. The comparison of semicircle diameters reveals that the charge transfer resistance of Si/HG@LG is relatively smaller than that for Si/LG and m-Si/LG, and comparable with changing the electrode thickness.