Supporting Information

Three-dimensionally Interconnected Si Frameworks Derived from Natural

Halloysite Clay: High-Capacity Anode Material for Lithium-ion Battery

Hao Wan,^{1,2,†} Hao Xiong,^{1,2,†} Xiaohe Liu,^{1,*} Gen Chen,¹ Ning Zhang,¹ Haidong Wang,^{2,*} Renzhi Ma^{3,*} & Guanzhou Qiu²

¹ State Key Laboratory of Powder Metallurgy and School of Materials Science and Engineering, Central South University, Changsha, Hunan 410083, China. Email: liuxh@csu.edu.cn

² School of Minerals Processing and Bioengineering, Central South University, Changsha,
Hunan 410083, P. R. China. Email: joew@csu.edu.cn

³ International Center for Materials Nanoarchitectonics (WPI-MANA), National Institute for Materials Science (NIMS), 1-1 Namiki, Tsukuba, Ibaraki 305-0044, Japan. Email: MA.Renzhi@nims.go.jp

[†] These authors equally contributed to this work.

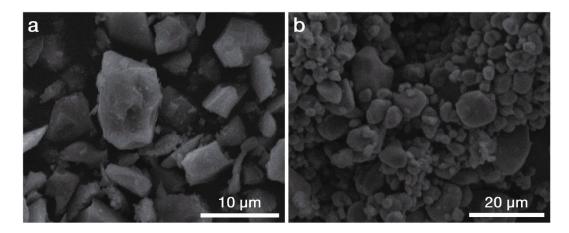


Figure S1 SEM images of commercial (a) Si and (b) LiCoO₂ electrode materials.

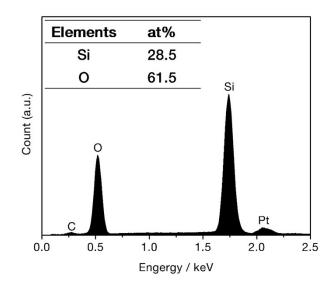


Figure S2. EDS pattern of acid-treated halloysite clay.

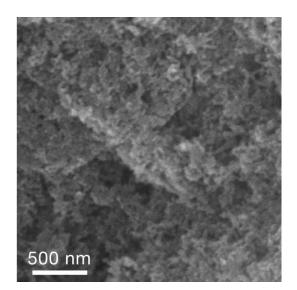


Figure S3. SEM image of the as-prepared 3D-interconnected Si frameworks.

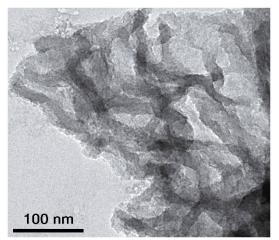


Figure S4. TEM image of the as-prepared Si frameworks after 20 cycles at the current density of 0.1 A g⁻¹.

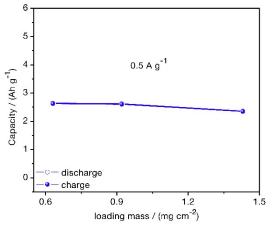


Figure S5. The specific capacity after 10 cycles at a current density of 0.5 A g^{-1} for the asprepared Si frameworks with different active material loading mass. Only a slow decay was observed with the loading mass increased manyfold, indicating the great potential in commercial Si anodes.