Supplementary Information

Nano-Si/FeSi₂Ti hetero-structure with structural stability for highly reversible lithium storage

Mi Ru Jo, a Yoon-Uk Heo, b Yoon Cheol Lee a and Yong-Mook Kang a*

a Department of Energy and Materials Engineering, Dongguk University-Seoul, 100-715 Seoul, Republic of Korea

b Research Facility center, Graduate Institute of Ferrous Technology Pohang University of Science and Technology, Pohang, Kyungbuk 790-784, Republic of Korea.

* Corresponding authors: dake1234@dongguk.edu
**Fig. S1** Ternary system of (a) Fe-Si-Ti liquidus projection and (b) Fe-Si-Ti tentative isothermal section at 900°C.
**Fig. S2** SEM image of Melt-spun Si-Ti-Fe alloy ribbons before grinding; (a) × 5,000, (b) × 20,000.
Fig. S3 STEM images of Nano-Si/FeSi$_2$Ti hetero-structure after 50$^{th}$ cycles.
**Fig. S4** The differential capacity plots of Nano-Si/FeSi$_2$Ti hetero-structure at 1, 2, 30 and 50$^{th}$ cycle.
**Fig. S5** The electrochemical performance of Si nanoparticles and Nano-Si/FeSi$_2$Ti heterostructure: (a) the cyclic performance at 0.1C, (c) capacity retention amounts when conducting charge-discharge cycles at various current rates.