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Supporting Information

Activated natural porous silicate for a highly promising SiO_x nanostructure finely impregnated with carbon nanofiber as a high performance anode material for lithium-ion batteries

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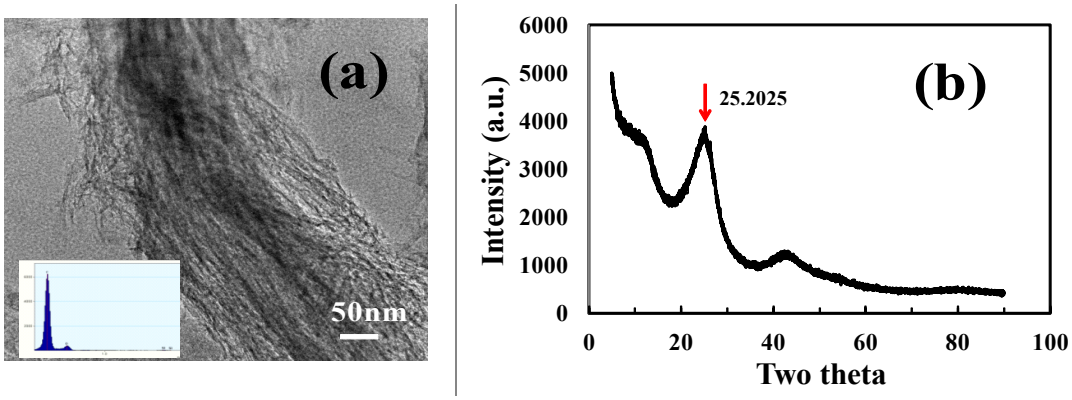

Fig. S1. (a) TEM image of the CNFs that were collected from the CNF-sepiolite nano-composite by removing the sepiolite only. The CNF-sepiolite nanocomposite was first acid treated using hydrochloric acid to remove Mg element, and then dissolved in hydro-fluoric (HF) solution to remove silica material. This procedure induces in the remaining of the pure CNFs only. The fibrous morphology of the CNFs having the size of several nm in the thickness and several μm in the length reflects the fiber structure of the sepiolite having the nano open-channels along its axis. The inset of Fig. S1(a) shows the EDS spectrum for the chemical composition of the CNFs having pure carbon element. (b) XRD pattern of the CNFs. The inter layer distance between graphene layers of the CNFs, d002, is 3.53 nm by the calculation using Bragg's equation.

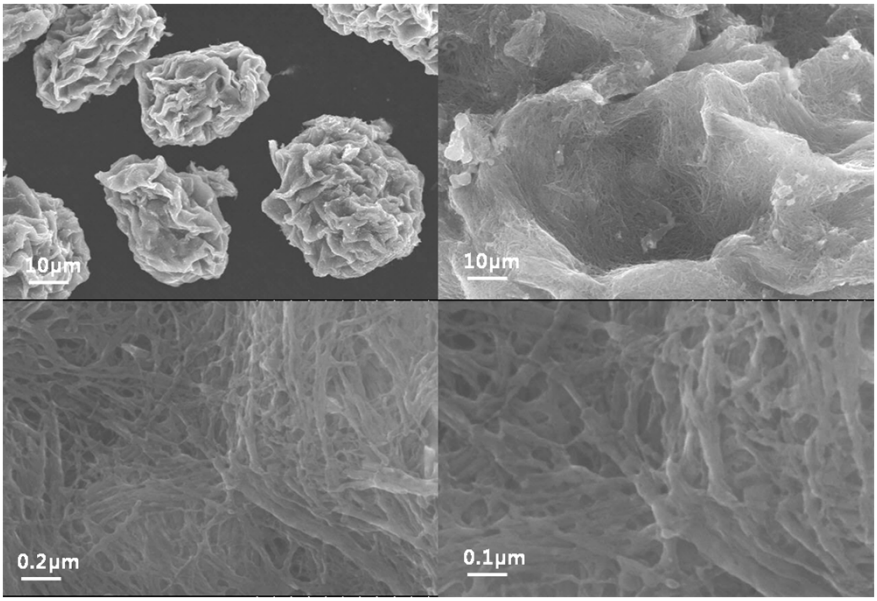

Fig. S2. SEM images of the morphology of CNF-SiO_x nanostructures. The secondary bulk particle is in a size range between 30~40 μm and has the shape of a roundly bunched piece of CNF-SiO_x nanostructure. The primary particles of 30~40 nm in diameter are inter-connected with each other to form porously network bulk structure.

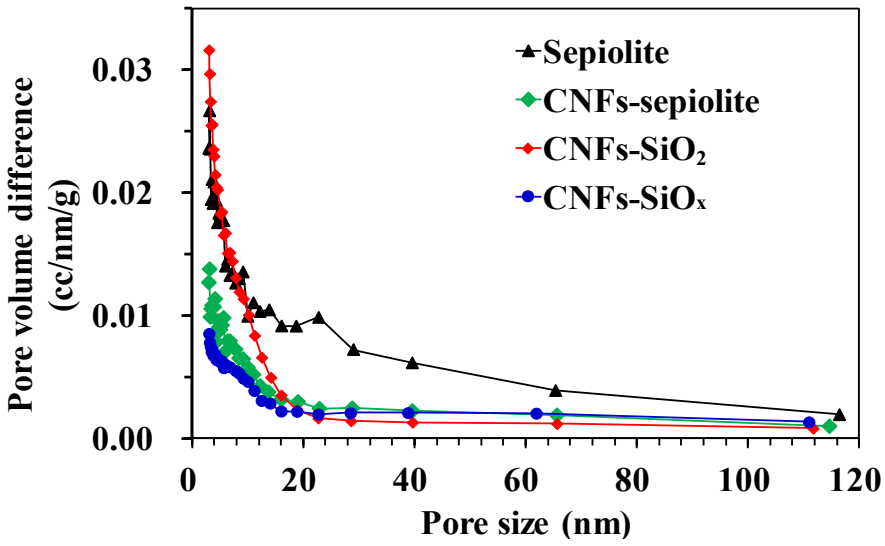

Fig. S3. Pore size distribution by the BJH measurement of the sepiolite derived nanostructures using nitrogen adsorption at 77K.