

Supporting Information

Silicon-Nanoparticles Isolated by *In-Situ* Grown Polycrystalline Graphene Hollow Spheres for Enhanced Lithium-Ion Storage

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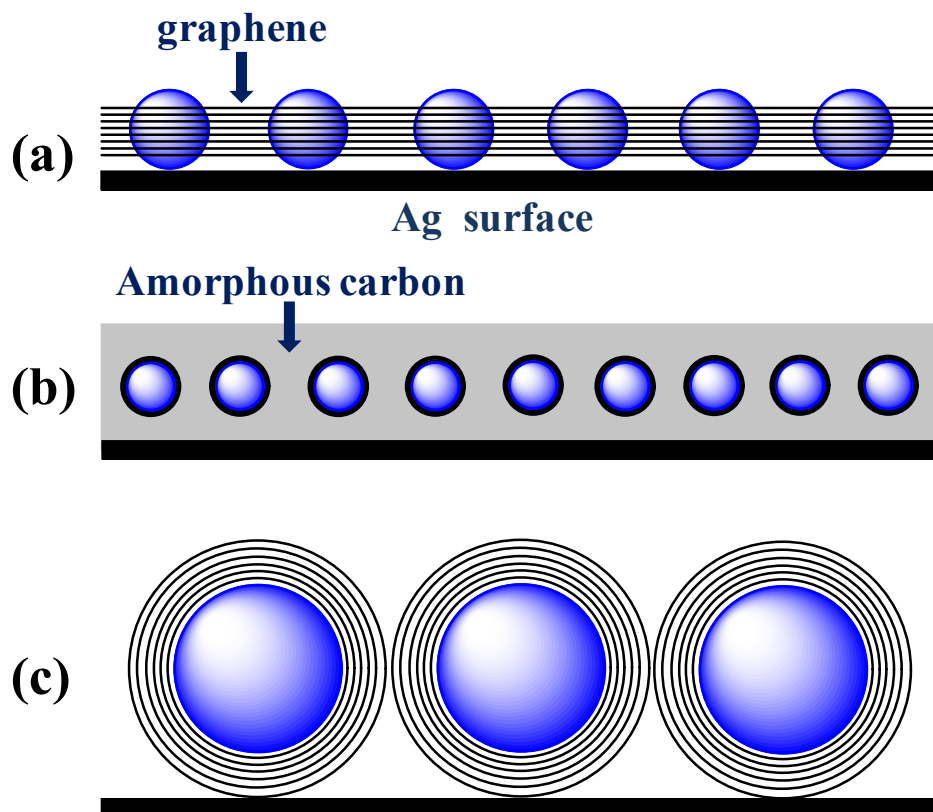


Figure S1. Schematic illustration of the influence of the amount of the catalyst precursor on the structure and degree of graphitization of the carbon shell: (a) At an appropriate FeSO_4 concentration, the discrete graphene nanoislands produced around each Fe nanoisland will interconnect to form a compact and uniform polycrystalline graphene shell throughout the Ag surface, (b) At a low FeSO_4 concentration, an amorphous carbon-rich shell is obtained due to the excessive carbon source, (c) At a high FeSO_4 concentration, the size of the *in-situ* formed Fe nanoparticles is too large to catalyze the growth of an integrated polycrystalline graphene shell. The obtained coating layer is in fact composed of a series of closely packed graphene encapsulated Fe nanoparticles. The blue spheres represent the Fe nanoislands (or nanoparticles).

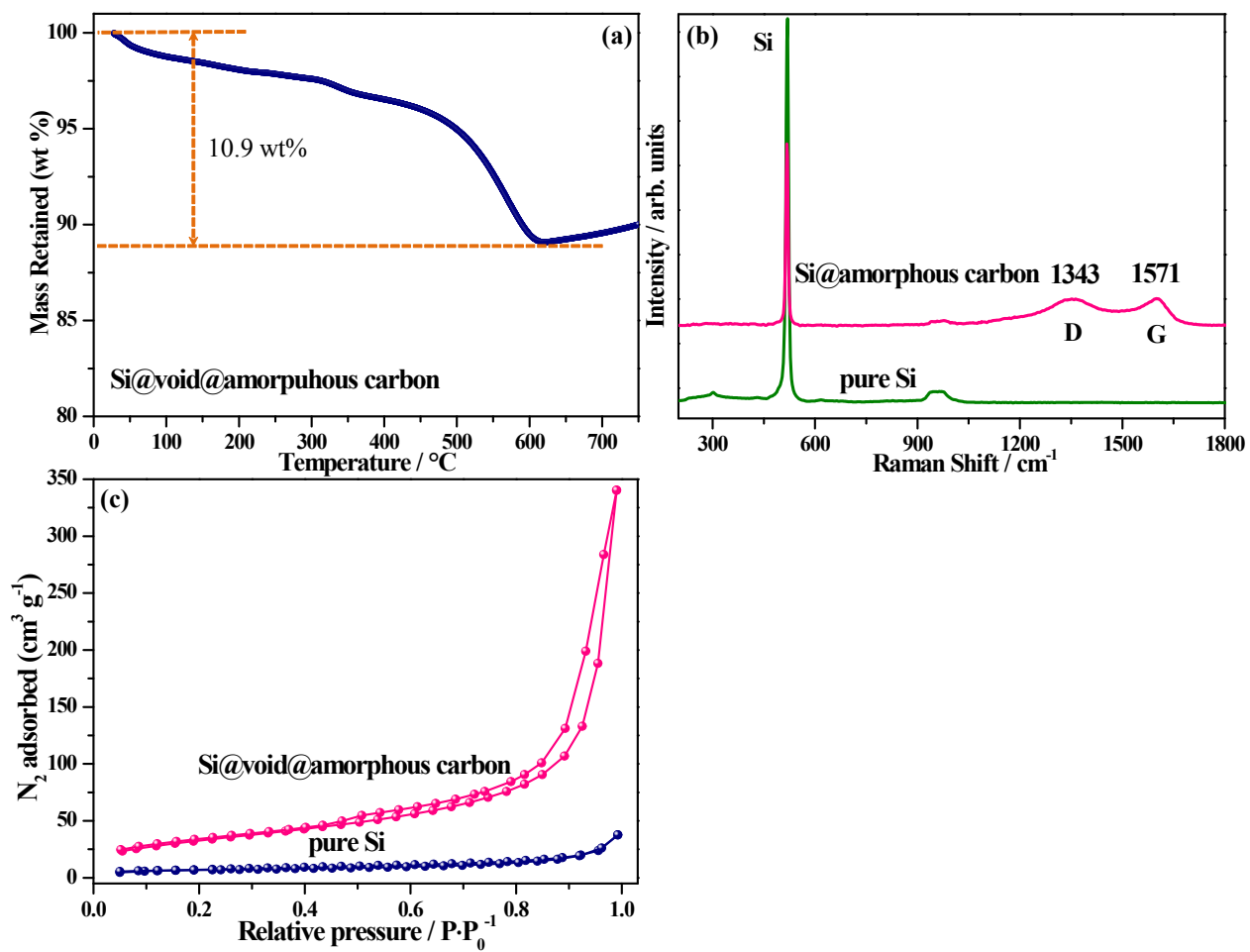


Figure S2. (a) TGA thermogram of the Si@void@amorphous carbon nanocomposites, (b) Raman spectra of the SiNPs and Si@void@amorphous carbon nanocomposites and (c) N₂ sorption isotherms of the pure SiNPs and Si@void@amorphous carbon nanocomposites.

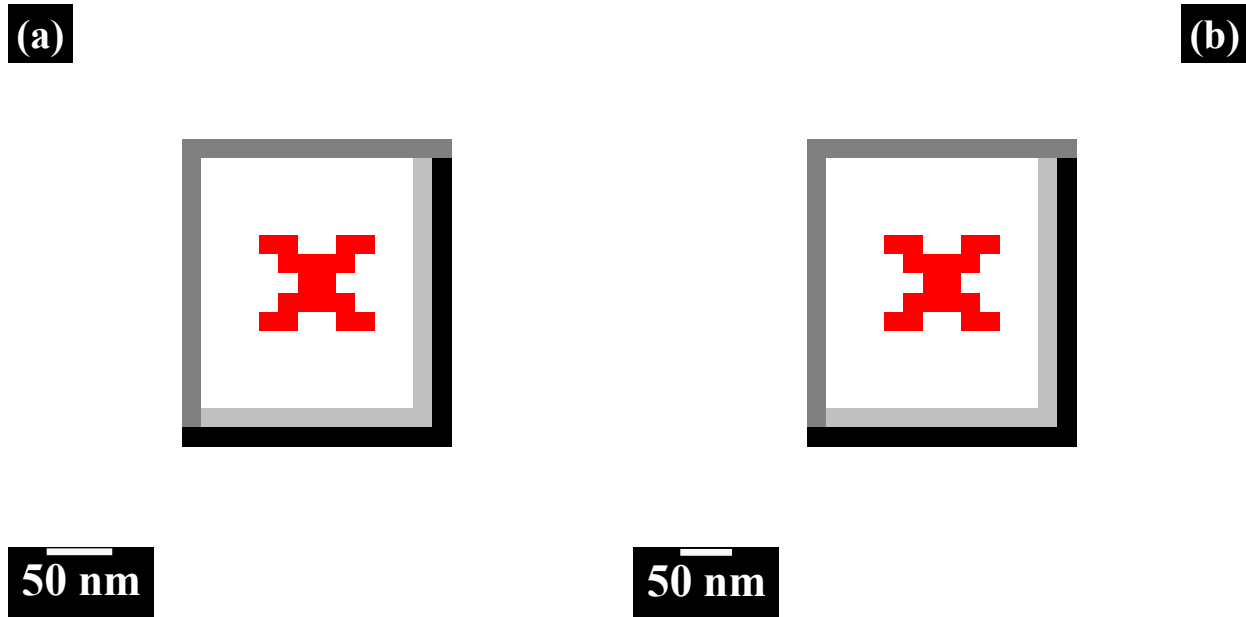


Figure S3. TEM images of (a) Si@void@graphene and (b) Si@void@amorphous carbon electrodes after the initial ten cycles in their fully discharged (lithiated) state.

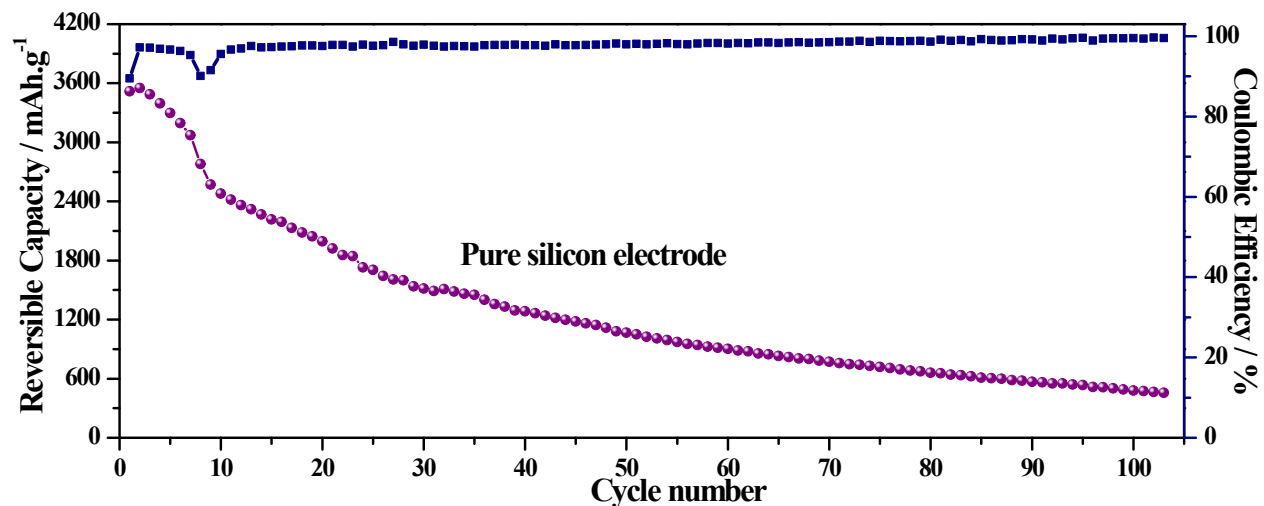


Figure S4. Reversible charge (delithiation) capacity and Coulombic efficiency versus cycle number profiles of the pure SiNPs electrodes.

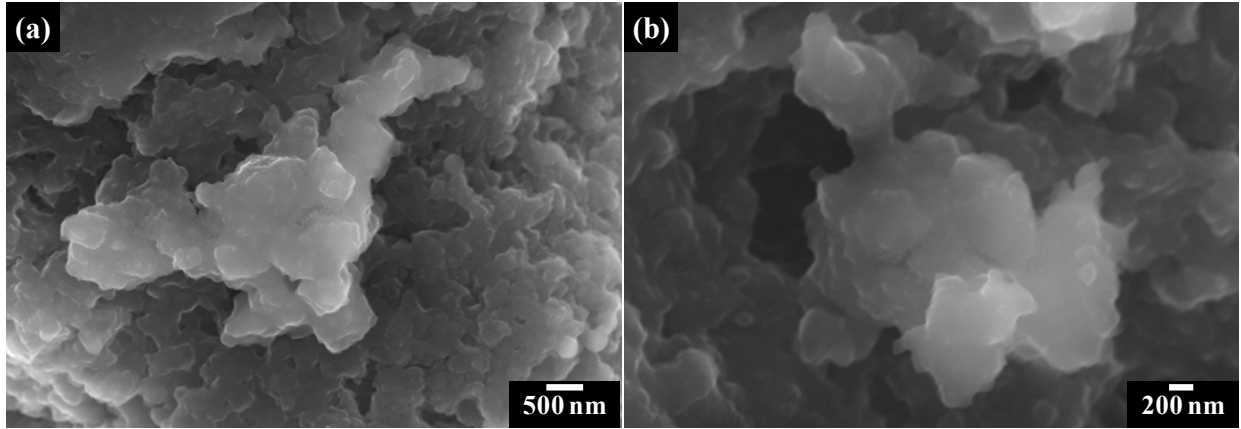


Figure S5. SEM images of the Si@void@amorphous carbon electrode after 600 cycles.