# Supporting Information

## Mesoporous $TiO_2$@N-doped Carbon Composite Nanospheres Synthesized by Direct Carbonization of Surfactants after Sol-gel Process for Superior Lithium Storage

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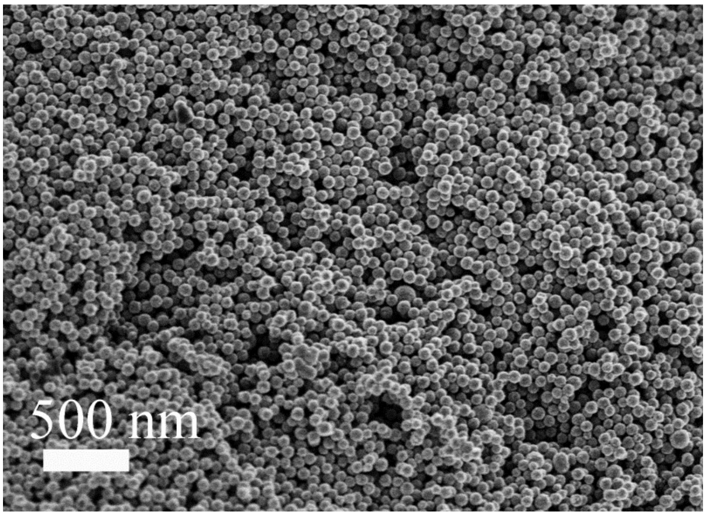

**Figure S1.** SEM image of the amorphous $TiO_2$ nanospheres synthesized via double surfactant assisted assembly sol-gel process.

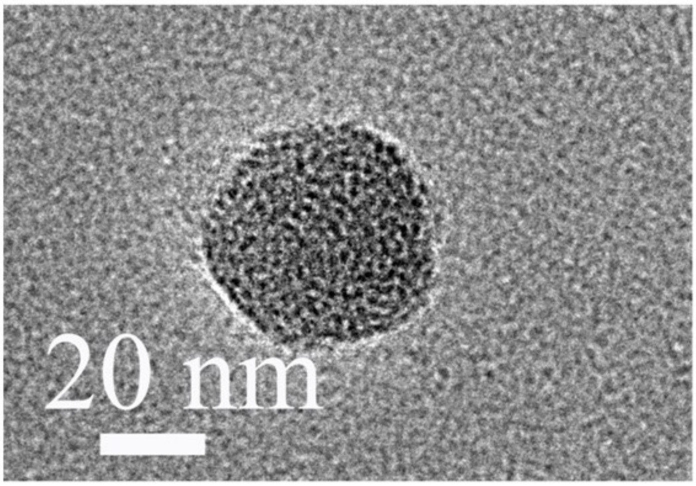

**Figure S2.** TEM image of the amorphous $TiO_2$ nanosphere synthesized via double surfactant assisted assembly sol-gel process.

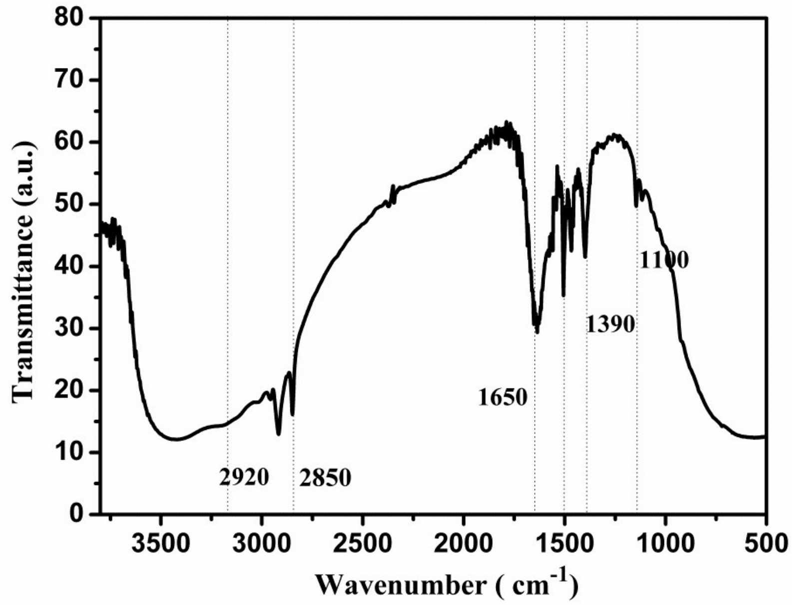

**Figure S3.** FTIR spectrum of the amorphous $TiO_2$ nanospheres synthesized via double surfactant assisted assembly sol-gel process.

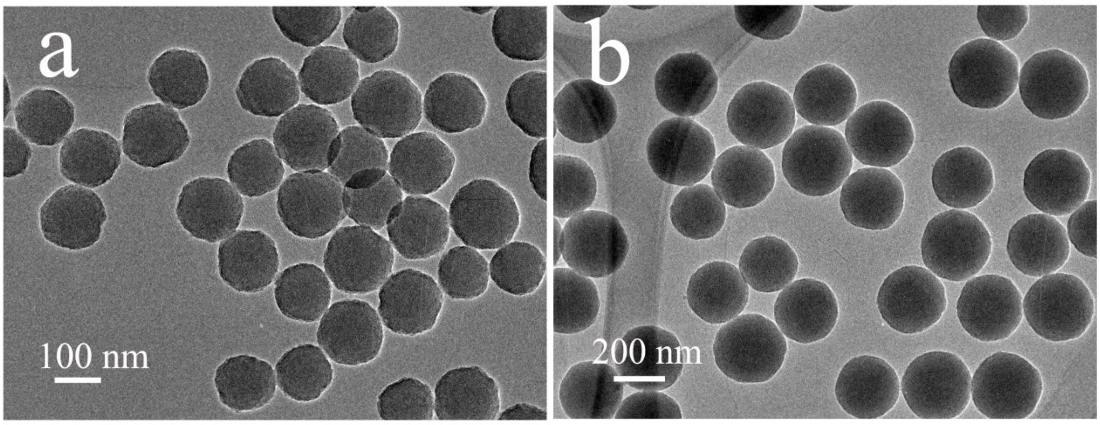

**Figure S4.Monodisperse** amorphous $TiO_2$ nanospheres with different diameter size synthesized via double surfactant assisted assembly sol-gel process(a,150 nm; b,250 nm).

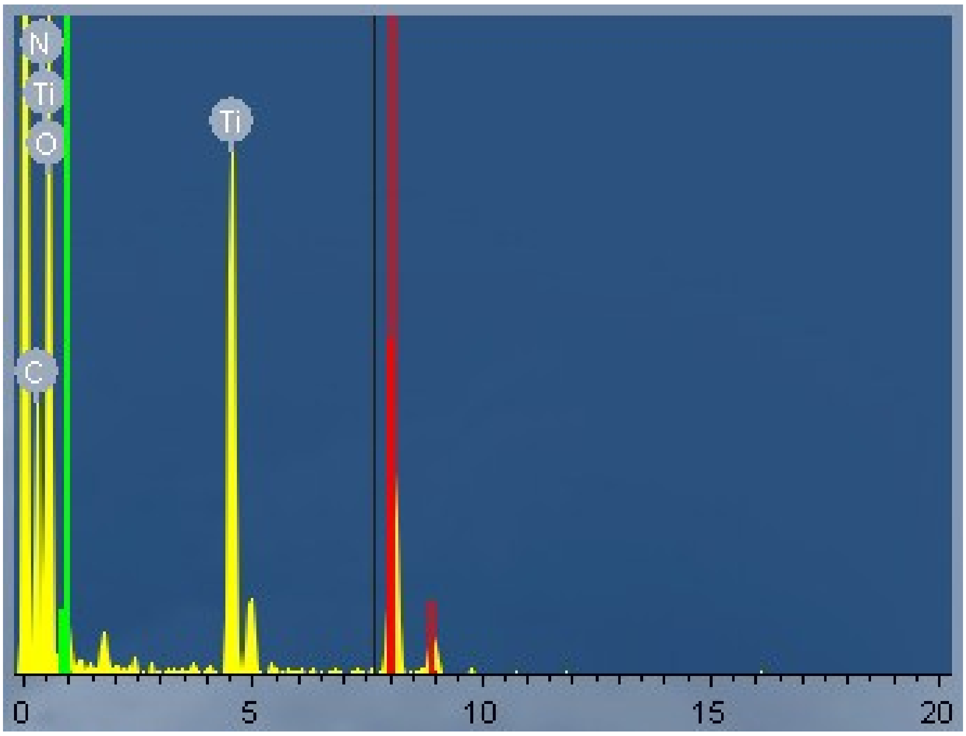

**Figure S5.** The energy dispersed X-ray spectrum (EDS) of the $TiO_2$@N-doped carbon composite nanospheres synthesized via double surfactant assisted assembly sol-gel process followed by sequential carbonization of surfactants in $N_2$ atmosphere.

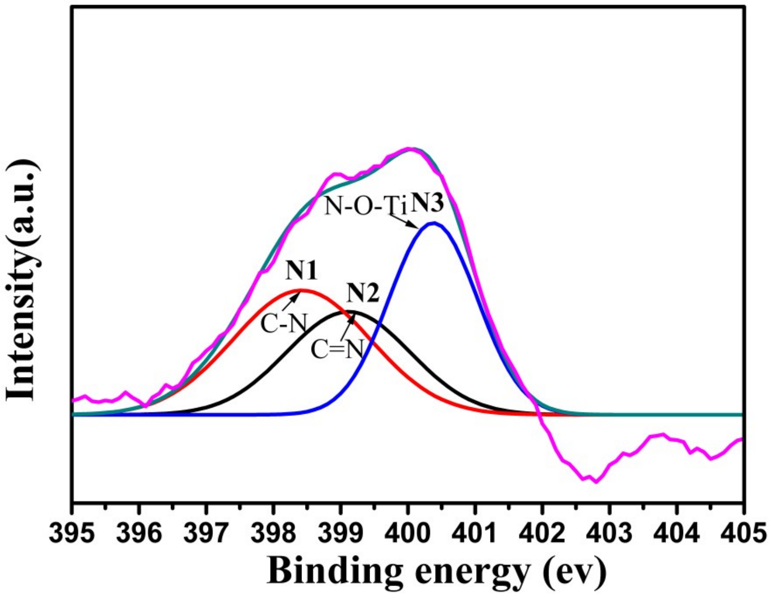

**Figure S6.** The high-resolution XPS spectra of N1s in $TiO_2$@N-doped carbon composite nanospheres synthesized via double surfactant assisted assembly sol-gel process followed by sequential carbonization of surfactants in $N_2$ atmosphere.

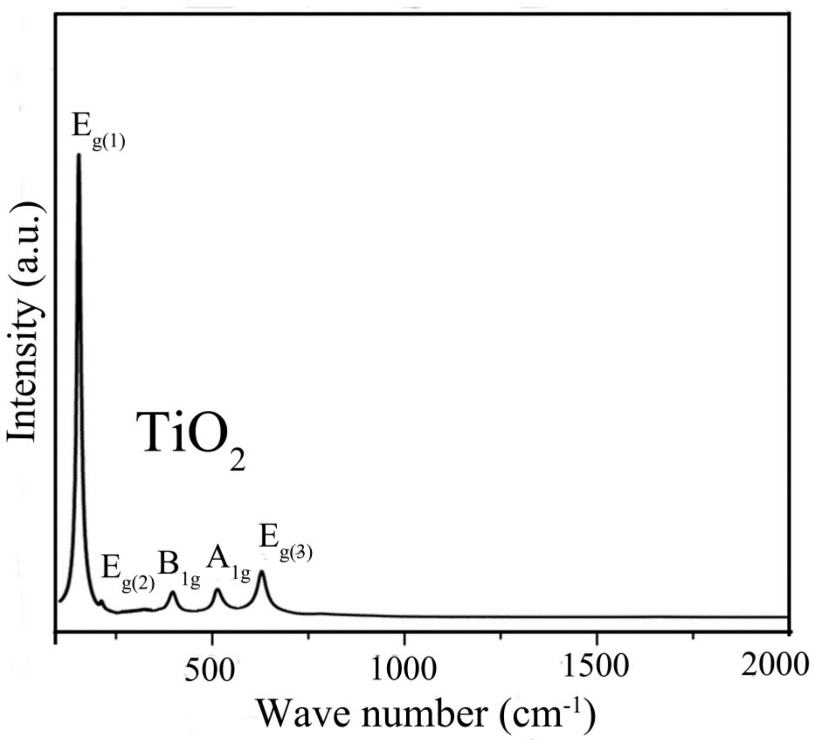

**Figure S7.** Raman spectrum of the mesoporous $TiO_2$ nanospheres obtained through solvothermal treatment followed by calcination in air at 700 °C.

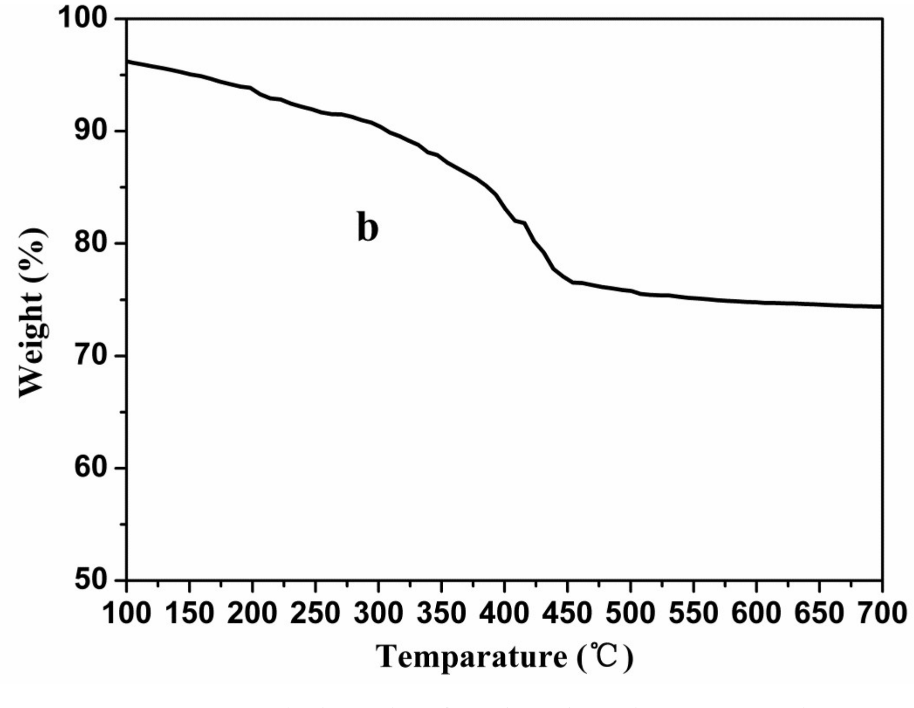

**Figure S8.** TG curve of the $TiO_2$@N-doped carbon composite nanospheres synthesized via double surfactant assisted assembly sol-gel process followed by sequential carbonization of surfactants in $N_2$ atmosphere.

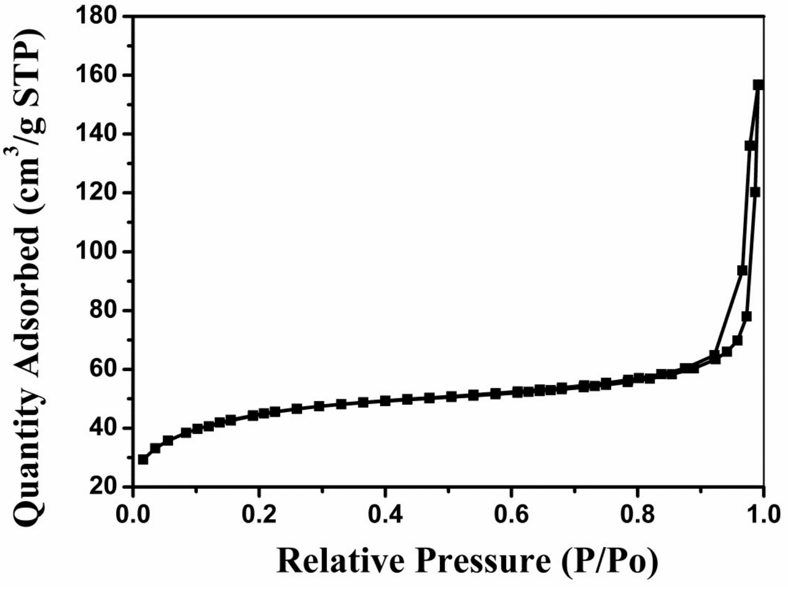

**Figure S9.** Nitrogen sorption isotherms of the mesoprous $TiO_2$ nanospheres obtained obtained through solvothermal treatment followed by calcination in air at 700 °C.

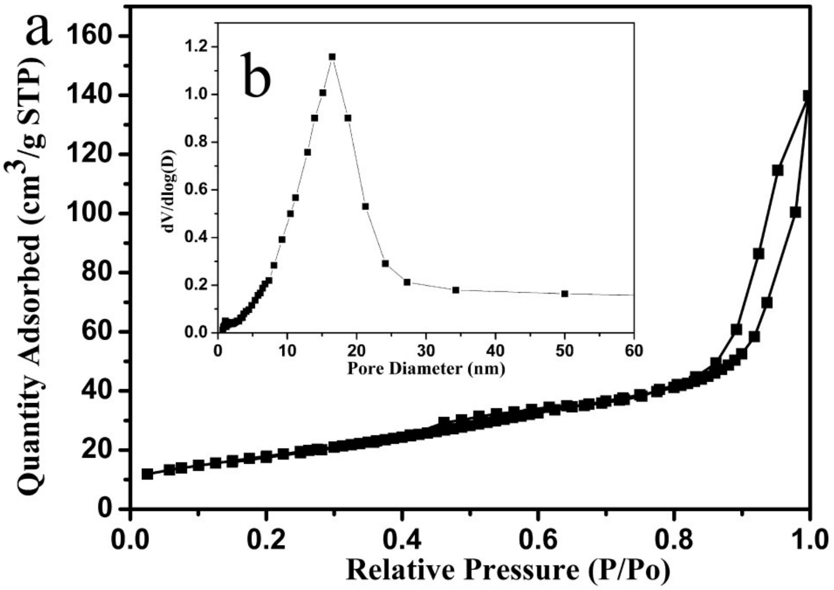

**Figure S10.** (a) Nitrogen adsorption/desorption isotherms and (b) pore size distribution curves of the mesoporous $TiO_2$@N-doped carbon composite nanospheres after 200 cycles.