Electronic Supplementary Information (ESI)

Micro/Nano-Complex-Structure SiO$_x$-PANI-Ag Composites with Homogeneously-Embedded Si Nanocrystals and Nanopores as High-Performance Anodes for Lithium Ion Batteries

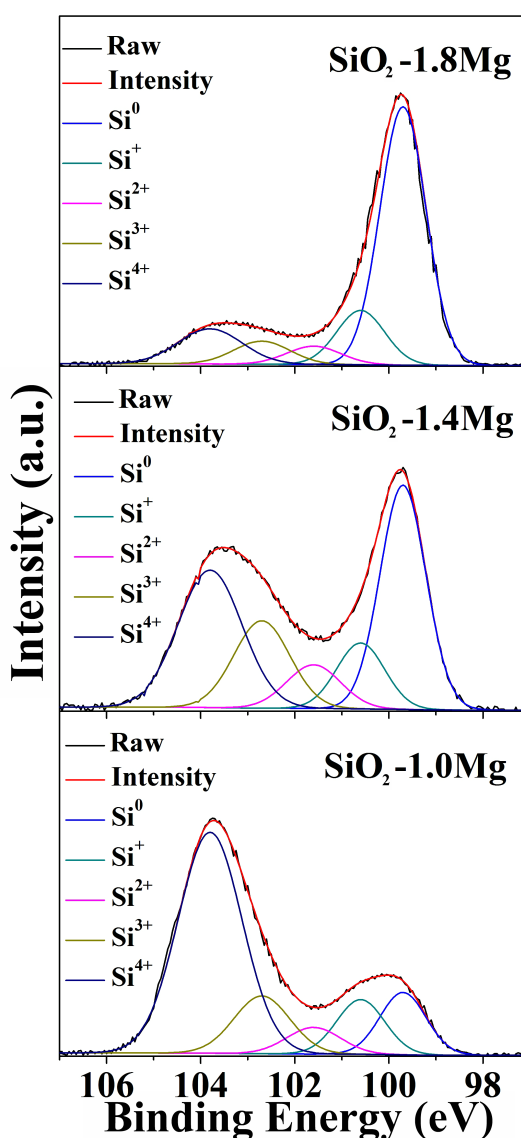Pinjie Zhang,[a] Lianbang Wang,[a*] Jian Xie,[a] Liwei Su[a*] and Chun-an Ma[a]

Fig. S1 XPS Si2p for SiO$_x$ microparticles from precursors with different SiO$_2$:Mg ratios.
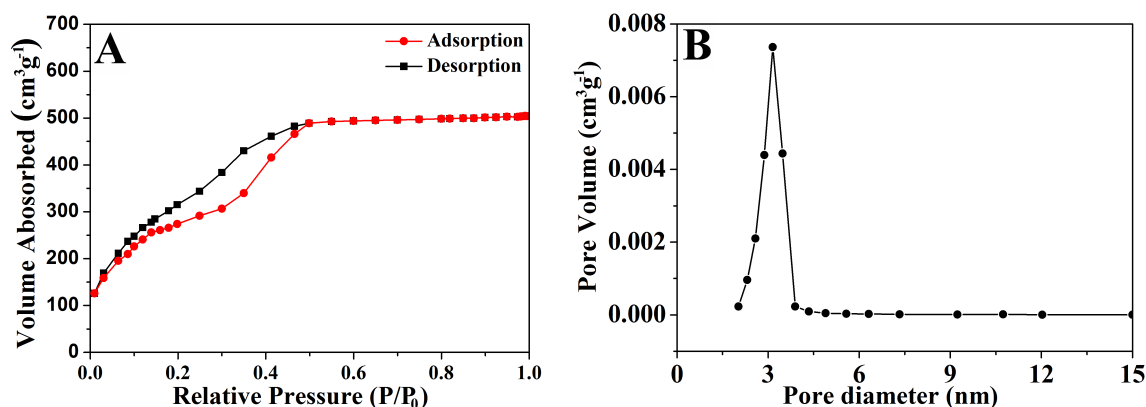
Fig. S2 N_2 adsorption-desorption isotherms of nanoporous SiO_x (SiO_2-1.8Mg) (A) and the corresponding pore-size distribution plot (B).

Table S1 Characterization of nanoporous structures for SiO_x microparticles from precursors with different SiO_2:Mg ratios.

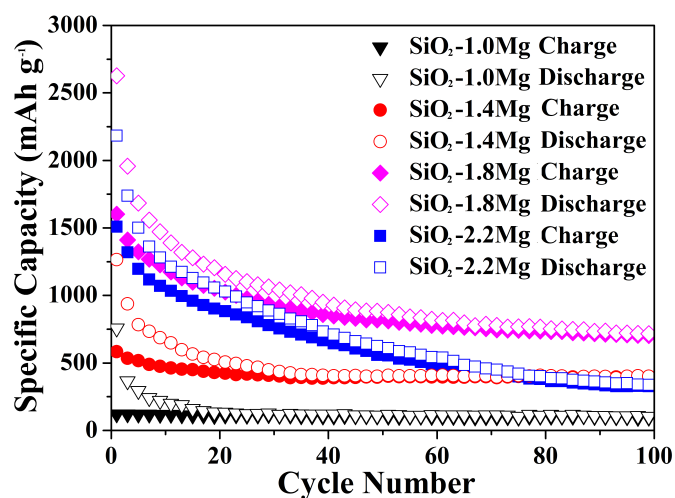| SiO_x samples	Specific surface area (m^2 g^{-1})	Specific pore volume (cm^3 g^{-1})	Average pore diameter (nm)
SiO_2-1.0Mg	1147.4	0.71	3.05
SiO_2-1.4Mg	1142.9	0.68	3.01
SiO_2-1.8Mg	1151.3	0.74	3.15
SiO_2-2.2Mg	1145.7	0.69	3.04

Fig. S3 Cycling performances for nanoporous SiO_x microparticles at 100 mA g^{-1} between 0.01-2.0 V.
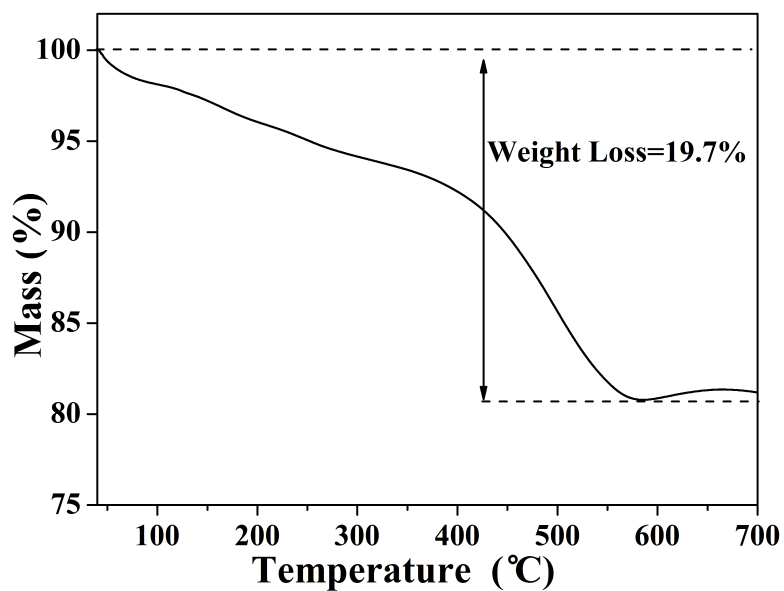
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Fig. S4 TGA curves of SiO_x-PANI-Ag composites in air at a heating rate 5 °C min^{-1}.
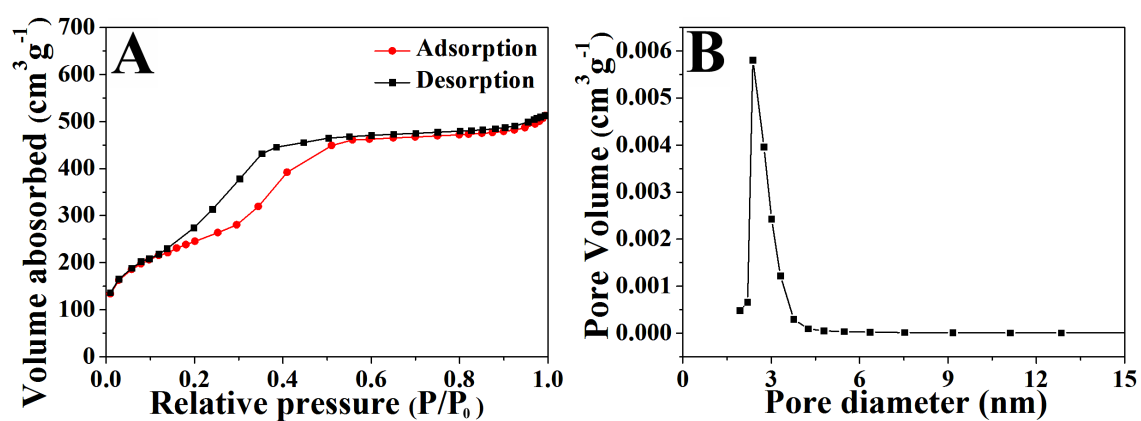

Fig. S5 N_2 adsorption-desorption isotherms of nanoporous SiO_x-PANI-Ag (SiO_2-1.8Mg) (A) and the corresponding pore-size distribution plot (B).
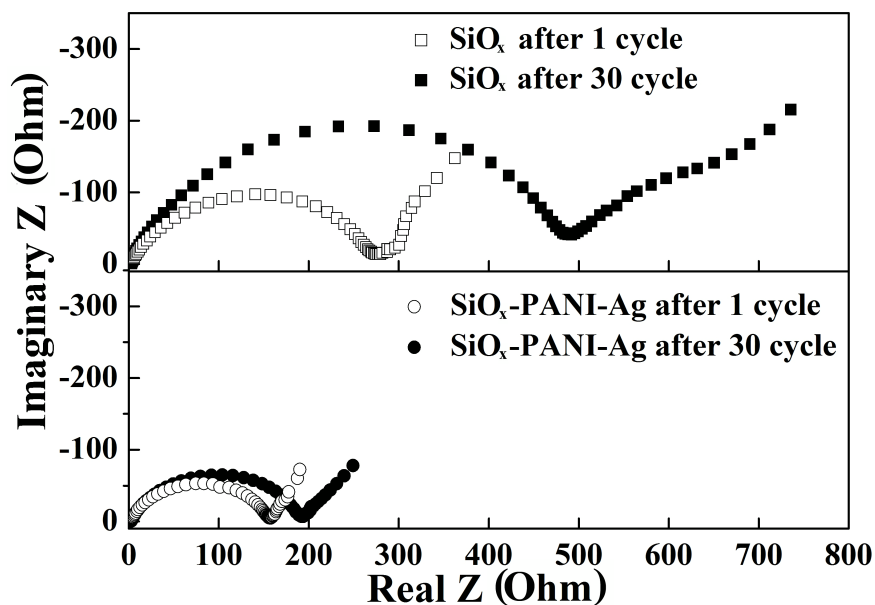
Fig. S6 Nqyuist plots for the EIS of nanoporous SiO_x and SiO_x-PANI-Ag composites at different states.
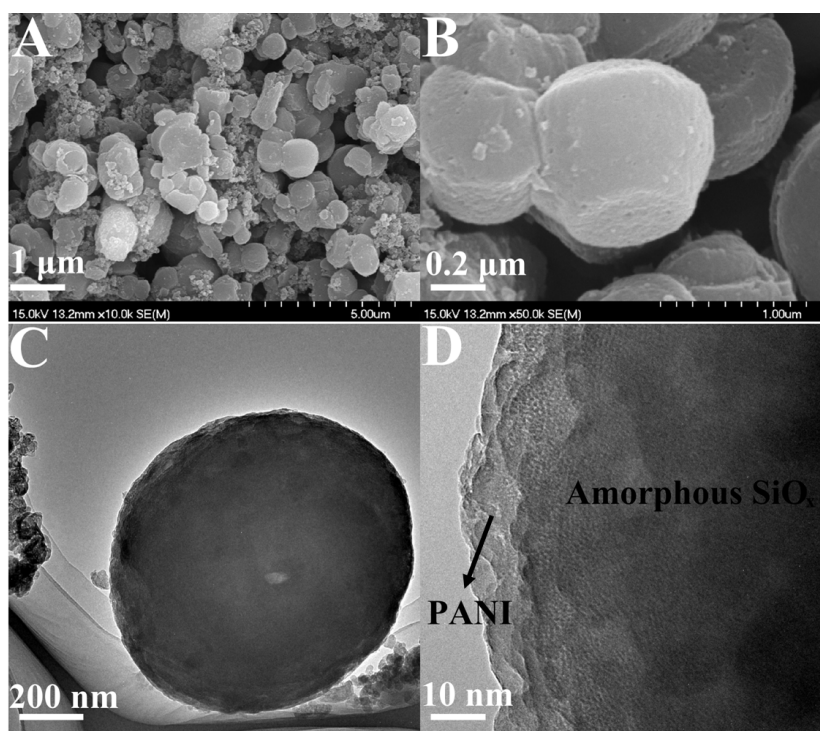

Fig. S7 SEM (A, B) and TEM (C, D) images of SiO_x-PANI-Ag composites after 20 cycles.