Electronic Supplementary Material (ESI) for Materials Chemistry Frontiers.

Supporting Information

Research progress of Si-based anode materials towards practical application in high energy density Li-ion batteries

Jin-Yi Li,[a,b] Quan Xu,[a,b] Ge Li,[a,b] Ya-Xia Yin,[a,b] Li-Jun Wan*[a] and Yu-Guo Guo*[a,b]

a. CAS Key Laboratory of Molecular Nanostructure and Nanotechnology, and Beijing National Laboratory for Molecular Sciences, Institute of Chemistry, Chinese Academy of Sciences (CAS), Beijing 100190, P.R. China. E-mail: ygguo@iccas.ac.cn, wanlijun@iccas.ac.cn.

b. School of Chemistry and Chemical Engineering, University of Chinese Academy of Sciences, Beijing 100049, P.R. China.

Table S1 Research progress of different Si-based materials

Si-based materials	Coloumbic Efficiency %	Delithiation Capacity mA h g^{-1}	Capacity Retention %	Areal Capacity mA h cm^{-2}	Cathode	Energy Density
Si NPs@Graphene[1]	59	1720	70% 150cycles			
Si/Nitrogen-doped carbon/CNT[2]	72	1380	74.7% 100cycles	1.2		
Si/C[3]	91.2	700	88.9% 200cycles	2.25		
Si/C microspheres [4]	89.2	620	75.1% 500cycles	2.54		
SiO/Graphite/CNT[5]	64.9	513	96.5% 130cycles			
SiO_x[6]	57.8	1100	88.5% 100cycles	4		
Mesoporous silicon sponge[7]	99.7	750	92% 300cycles	4.2		
Graphene-encapsulated Si microparticle[8]	93.2	3300	90% 100cycles	3.1	$LiCoO_2$	
nano-micro silicon/carbon[9]	88	450	92.3% 300cycles	2.6	$LiCoO_2$	
Si-graphite[10]	83	1090	83% 100cycles		$LiNi_{0.5}Co_{0.2}Mn_{0.3}O_2$	622 Wh kg^{-1}
Si-nanolayer-embedded graphite[11]	92	596	96% 100cycles	3.3	$LiCoO_2$	1043 Wh L^{-1}
Pre-lithiatied SiOx[12]	94.9	1369.3	76.3% 100cycles	2.36	$LiNi_{0.5}Co_{0.1}Al_{0.1}O_2$	508.5 Wh kg^{-1}

Table S1 summarized recent research progress of Si-based anode materials towards practical application based on the key aspects proposed in review. Herein, we focused on improving initial Columbic efficiency, areal capacity and energy density of full cell for further application.

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