

Supplementary Material

WSi₂ nanodots reinforced Si particles as anodes for high performance lithium-ion batteries

Xiangyang Zhou, Chucheng Luo, Jing Ding, Juan Yang* and Jingjing Tang*

School of Metallurgy and Environment, Central South University, Changsha 410083, China.

* Corresponding author.

E-mail address: tangjj@csu.edu.cn.

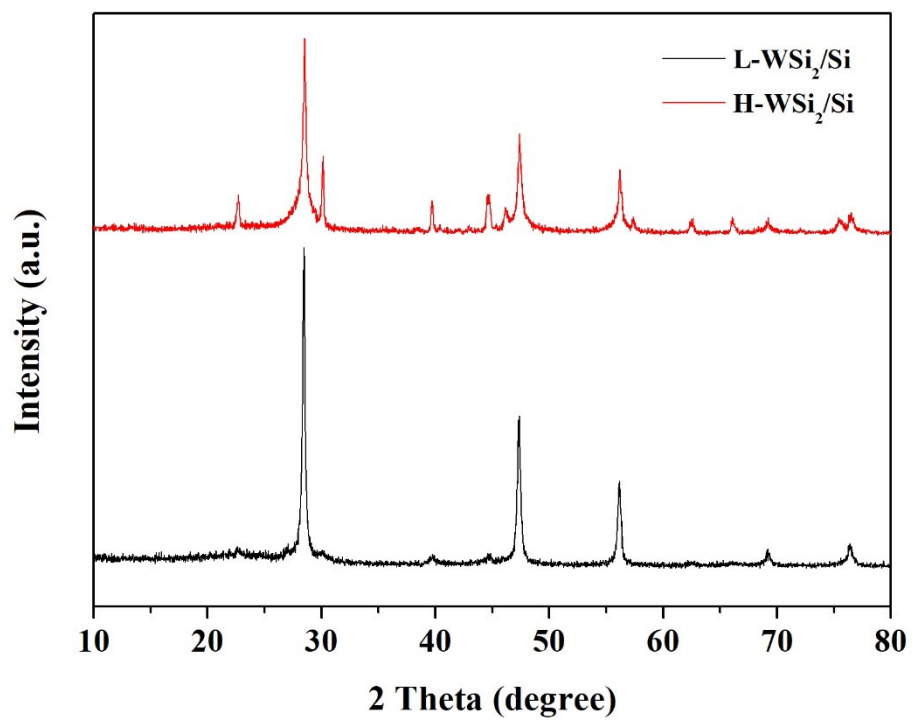


Fig. S1 XRD patterns of H-WSi₂/Si and L-WSi₂/Si.

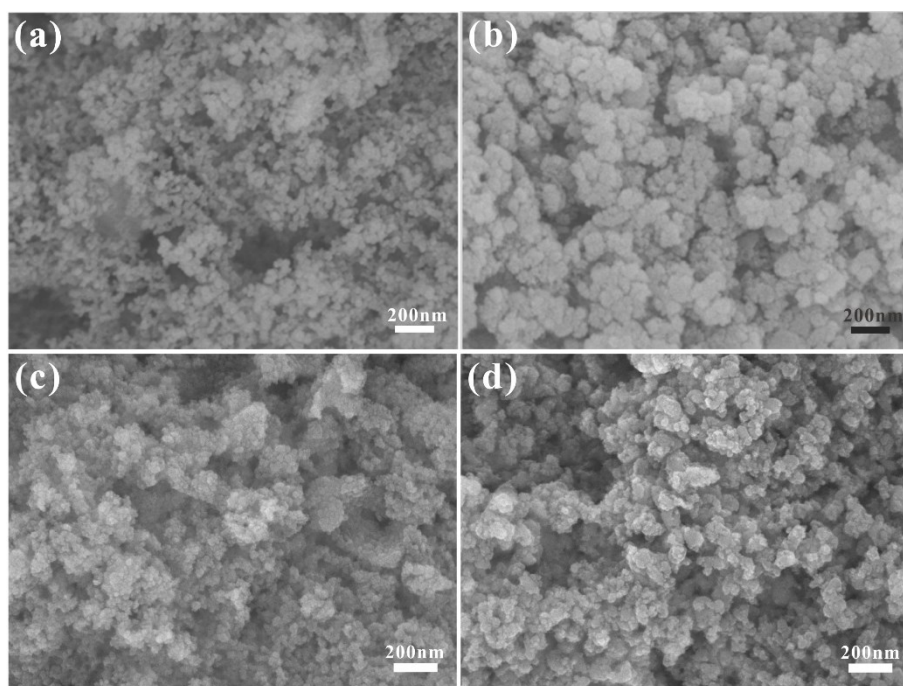


Fig. S2 SEM images of SiO₂ (a), p-Si (b), H-WSi₂/Si (c), L-WSi₂/Si (d).

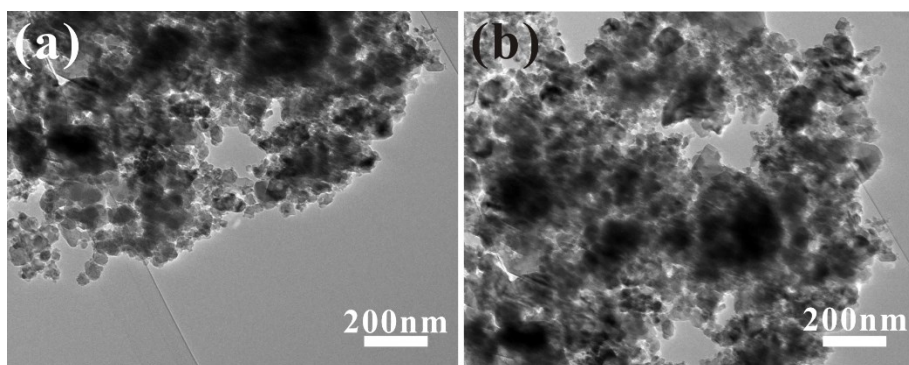


Fig. S3 TEM images of H-WSi₂/Si (a), L-WSi₂/Si (b).

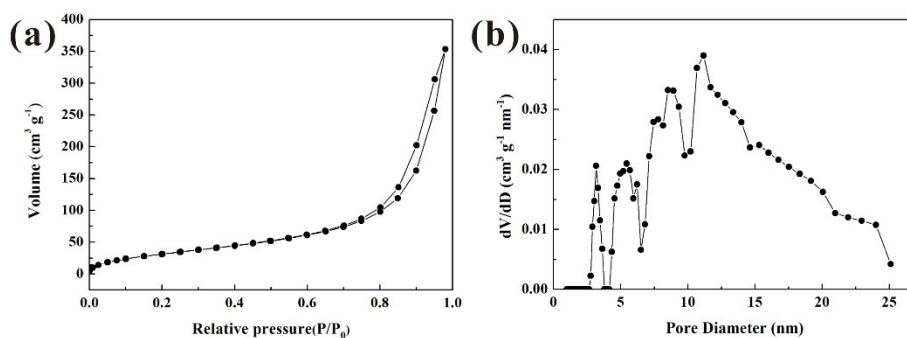


Fig. S4 N₂ adsorption/desorption curve (a) and pore size distributions of WSi₂/Si obtained from desorption data.

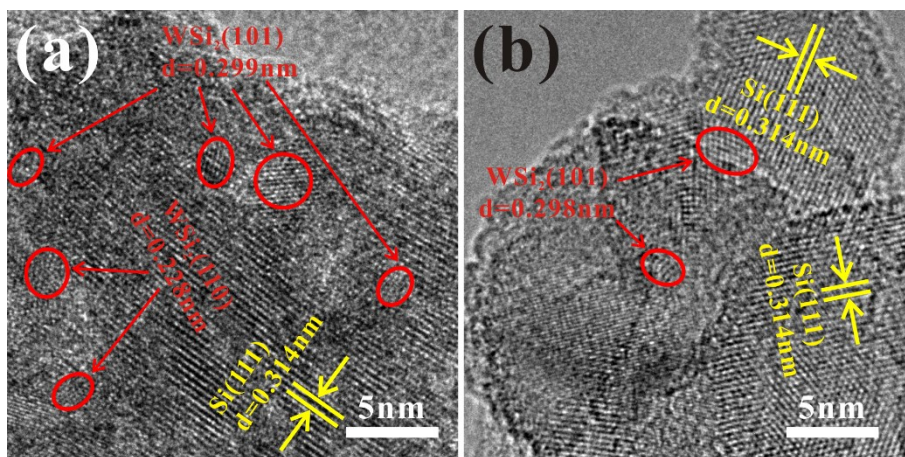


Fig. S5 HRTEM image of H-WSi₂/Si (a), L-WSi₂/Si (b).

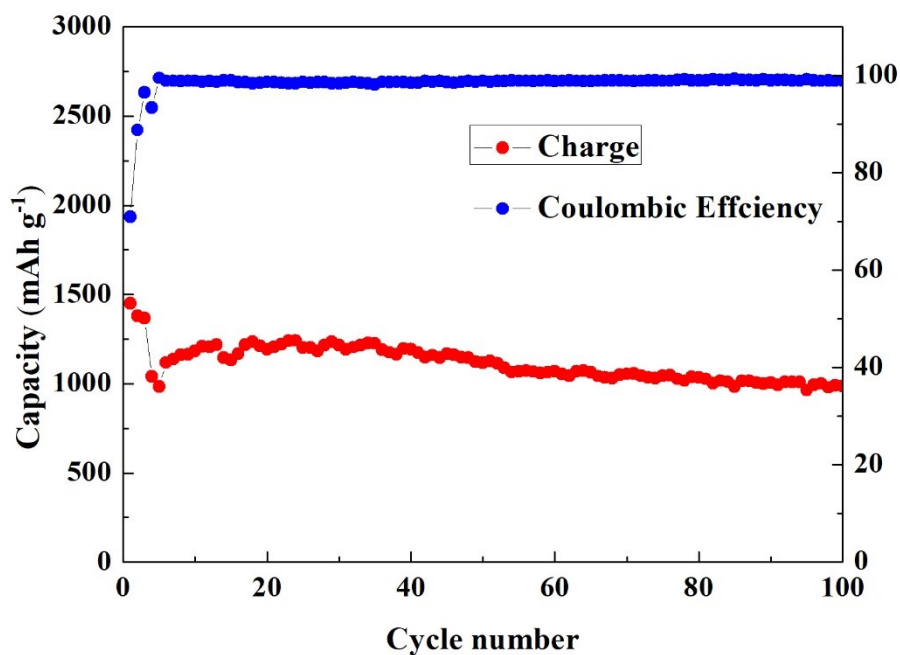


Fig. S6 Cycling performances at 0.2C of WSi₂/Si with a mass loading of ~1.45 mg cm⁻².

Table S1 Tungsten content in samples based on ICP

	Weight percent of W in this sample, %	Weight percent of WSi ₂ in this sample, %	Main element in this sample
WO ₃ -SiO ₂	4.83	0	Si, O, W
WSi ₂ /Si	5.75	7.51	Si, W
H-WSi ₂ /Si	12.6	16.45	Si, W
L-WSi ₂ /Si	1.75	2.28	Si, W

Table S2 Comparison of electrochemical performance of Si-based anodes in previous work and in this work.

Sample	Current density(mA/g)	Voltage range (V)	Cycle No.	charge capacity (mAh/g)	Ref.
TiSi ₂ /Si	500	0.01-1.2	100	1161	[1]
DSM/Si	100	0.01-1.5	100	1137	[2]
Sn ₁₅ /Si ₈₅	200	0.01-1.5	70	1544.7	[3]
SiC/Si	500	0.01-1.2	100	1670	[4]
BHP/Si	840	0.01-1.2	150	1400	[5]
MoSi ₂ /Si	840	0.01-1.2	150	1647.3	[6]
SiC/C/Si	500	0.01-1.5	550	1050	[7]
MgSi ₂ /C	100	0.02-2	500	451.8	[8]
WSi ₂ /Si	840	0.01-1.2	200	1504.8	This work

Table S3 The impedance parameters of the samples before cycling

Sample	R_o (Ω)	R_{ct} (Ω)	D_{Li^+} ($m^2 s^{-1}$)
Si	3.784	244.2	3.45×10^{-22}
WSi ₂ /Si	2.094	91.14	3.66×10^{-21}

References

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