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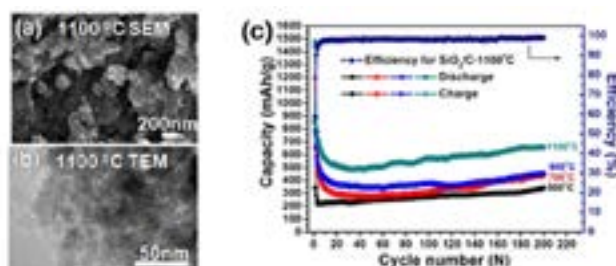
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Improvement of electrochemical performance of SiO₂/C nanocomposites as anode for lithium ion batteries through high temperature heat treatment

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In recent years, silica (SiO₂) has been regarded as a promising anode material for the lithium ion batteries (LIBs) due to its low discharge potential, high theoretical specific capacity, and abundant in nature. However, some intrinsic characteristics, such as the poor electrical conductivity, large volume variation during the repeated charge-discharge process and strong crystalline Si-O bond, to a large extent hinder the practical application of SiO₂. Therefore, developing a strategy, which is easily controllable, low-cost, nontoxic and highly productive, to enhance the lithium storage performance of SiO₂/C composites is necessary. In this work, we prepared the SiO₂/C nanocomposites through a simple and low-cost heat treatment process. When the as-obtained nanocomposites were used as anodes for the lithium ion batteries, they exhibited a high specific capacity of 660 mA h g⁻¹ at 100 mA g⁻¹ after 200 cycles. In addition, a good rate capability was also achieved through the heat treatment. The improved electrochemical performance of the SiO₂/C nanocomposites is mainly ascribed to the increment of crystalline interplanar spacing and the increased defects in the carbon-coated structure, which is beneficial to embed a larger number of lithium-ions.



Recent Publications:

1. W.L. An, J.J. Fu, J.J. Su, L. Wang, X. Peng, K. Wu, Q.Y. Chen, Y.J. B, B. Gao, X.M. Zhang, J. Power Sources 345 (2017) 227.
2. H. Wang, P. Wu, M.T. Qu, L. Si, Y.W. Tang, Y.M. Zhou, T.H. Lu, ChemElectroChem 2 (2015) 508.
3. X. Cao, X.Y. Chuan, R.C. Masse, D.B. Huang, S. Li, G.Z. Cao, J. Mater. Chem. 3 (2015) 22739.
4. M.L. Jiao, K.L. Liu, Z.Q. Shi, C.Y. Wang, ChemElectroChem 4 (2017)
5. Z.N. Yuan, N.Q. Zhao, C.S. Shi, E.Z. Liu, C.N. He, F. He, Chem. Phys. Lett. 651 (2016) 19.

Biography

Chunsheng Shi received his PhD from Tianjin University in 2002, and is currently a Professor of Materials Science and Engineering, Tianjin University. His research mainly focuses on composites and energy storage materials.

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