

Nanomaterials from rice husks to use as an anode for li-ion battery

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Li-ion batteries are becoming the most common electrical energy storage systems for modern electronic devices. The electrochemical performances of these batteries depend on electrode materials used to produce them. Nowadays, silicon is one of the most attractive anodes for high energy density Li-ion batteries, and will most likely dominate the market in the near future. Nanostructures of silicon, silica, and other silicon derivatives can be produced from rice husk, which is a widely available agricultural waste in rice producing countries throughout Asia. In this work, we have studied the potentials of producing nanostructured silicon and silicon derivatives using rice husk as starting raw materials. Nano-silicon and its derivatives can be extracted from rice husk using simple chemical and thermal processes [1,2]. X-ray diffraction (XRD) was used to verify crystalline phase formations and phase purity. The particle sizes of <10-20 nm having spherical particles can be seen using Transmission electron microscopy (TEM) and Scanning electron microscopy (SEM). These nanomaterials produced from rice husks exhibit high performances as anodes for next generation and low cost Li-ion batteries.

References:

- [1] D.S. Jung, M.H. Ryou, Y.S. Jung, S.B. Park and J.W. Choi, PNAS. 110 (2013) 12229-12234
- [2] N. Liu, K. Huo, M.T. McDowell, J. Zhao, Y. Cui, Sci. Rep., 2013.