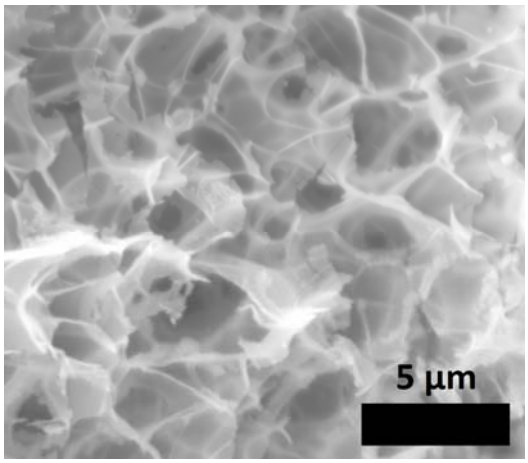
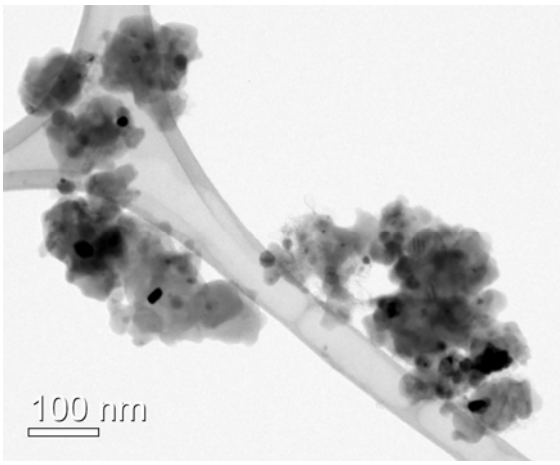
NTNU NanoLab

Nanostructured Li_2FeSiO_4/C synthesized by a modified sol-gel method

Li_2FeSiO_4/C composites used as cathode materials in Li-ion batteries have been synthesized by a modified sol-gel process. The process is water-based and uses environmentally friendly precursors. By careful control of synthesis parameters a highly porous material built up from 20-50 nm sized crystallites is obtained. A SEM image of the porous material and a TEM image of the nanosized crystallites comprising the walls of the pores are shown in the images below. The nanostructuring combined with a thin layer (2-5 nm thick) of carbon coating provides high conductivity and gives high discharge capacity, close to the theoretical values, when applied in a Li-ion battery. The work is carried out at the department of Materials Science and Engineering.





SEM imag (left) and TEM image (right) of the Li2FeSiO4/C composite.

H. Zhou, M.-A. Einarsrud and F. Vullum-Bruer, Solid State Ion. (2012), doi:10.1016/j.ssi.2011.12.008