

X-ray micro CT and FIB-SEM tomography by microstructure measurements of porous cathodes for Li-ion battery

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In this work, a comparison of two methods of measurements in 3D-reconstruction of porous structures for Li-ion battery cathodes was conducted. X-ray micro-CT with 700nm resolution and FIB-SEM with 150nm resolution tomography was carried out to capture the porous microstructure of Li-ion battery cathodes. Two different cathodes that consist of active material, binder and pore were produced in different manufacturing processes. The 3D-reconstructed lithium battery structures through different methods were characterized by calculating pore structural properties. Also, electrolyte impregnation properties affecting performance of Li-ion battery were predicted and compared for two structures. As a result, according to two measurement methods, the difference of microstructural property was observed, but the tendency of mass transport property was same. It means that the pores which have a radius less than 700nm have a less influence on mass transport property.