

INORGANIC CHEMISTRY STUDENT EXIT TALK



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“Next-Generation Battery Electrode Materials Using Earth-Abundant Elements”

Abstract: Energy storage devices, especially batteries, are indispensable in modern society, providing power for electronic devices including smartphones and EVs, and storing renewable energies in the electric grid, etc. However, batteries still have a lot of problems, such as their limited energy density, slow charging speed, high cost, short cycle life, etc. In this talk, several important approaches to solve these issues will be discussed. First of all, the effect of 3D micro and macro structure of battery electrodes on the battery performance is discussed. The structure was mainly engineered by using a 3D printer, and the 3D electrodes were applied to sodium-ion batteries, supercapacitors, and lithium-metal anode for lithium-ion batteries (LIBs). Then, the synthesis methods of battery materials will be discussed because it greatly affects the cost of the materials. In this talk, two facile synthesis methods of silicon/carbon composites (laser synthesis and re-precipitation synthesis) will be proposed for low-cost, high-performance LIBs. At the end of the talk, the battery working mechanisms will be discussed for sodium-ion batteries and zinc-ion batteries, which are expected to become as important as lithium-ion batteries in the future, by throughout characterization techniques at various charge and discharge states.

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Yoo Seminar & Conference Hall