

In situ powder diffraction: Filming Chemical Reactions

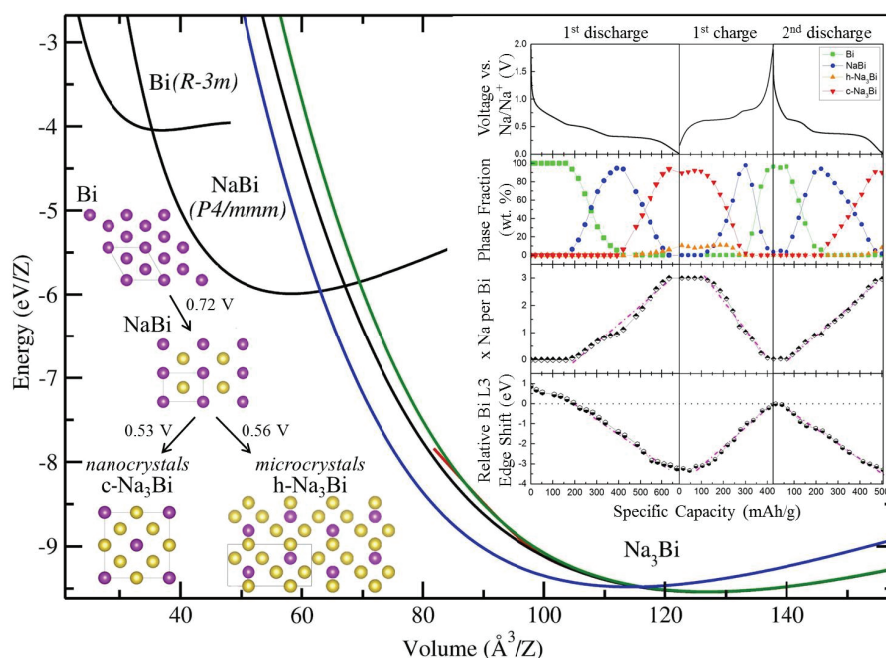
In this project you will use X-ray diffraction to look at the chemical structure of materials in real time during chemical reactions! This can provide us with really useful information on how to develop the future materials for energy storage, chemical processing and many other applications. The project will involve extensive use of the advanced instrumentation in the RECX X-ray lab at KI and may also involve visits to international laboratories (e.g. the European Synchrotron).

Examples of this:

- How does the crystal structure of a battery change during charge/discharge?
- How can we influence the properties of materials by nanoengineering?
- Where are the active species in a catalyst during reaction?
- Why do some catalysts stop working?
- Methods for making the active species more visible
- Analysis of the crystal structures of functional materials

What you will learn:

- How to use the advanced equipment in the X-ray laboratory
- X-ray crystallography-the science of extracting chemical information using X-ray diffraction
- To design and build special equipment for studying chemical reactions
- How to use modern software for analyzing X-ray data
- Become a key part of the Nafuma team and work closely with the researchers



Why does nanocrystalline bismuth make a better- anode for sodium batteries? In situ powder X-ray diffraction gives us the answer: a totally different atomic structure!

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