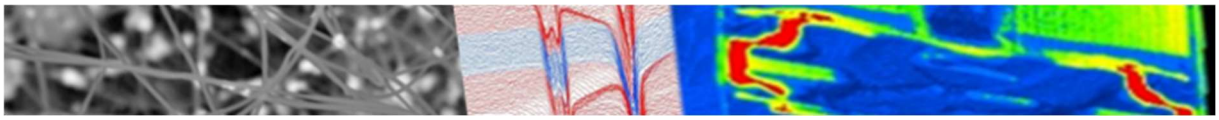
Karlsruher Institut für Technologie Institut für Angewandte Materialien



PhD Position

"Battery materials recycling using mechanochemical approach"

Publishing date: September 2021

Starting date: as soon as possible

Job description

Exponentially growing use of Li-ion batteries (LIBs) in portable electronics, vehicle propulsion, and other energy storage and distribution applications has substantially increased the amount of waste batteries (e-wastes). With the development of battery technology, the scale and variety of e-waste will only rise. Therefore, safe and economical recycling of spent LIBs and other energy storage media to recover high-value components represents considerable technological and ecological challenges. Currently, employed approaches to recycling of LIBs include pyrometallurgical, hydrometallurgical, and biohydrometallurgical methods. All of these methods have their pros and cons.

In the current project, we will focus on developing a robust method for recovering high-value components present in the electrode materials of spent LIBs, including Co, Ni, Mn, and Li using mechanochemical processing. This method will be utilized for battery materials with different chemistries, such as LCO, NMC, NCA, LFP, LMO. A big part of the research will also include "wet" chemistry and thermochemistry. Materials characterization techniques such as X-ray diffraction analysis, scanning electron microscopy, and different spectroscopic studies will be actively utilized to develop the recycling technology.

Personal qualification

You have a university degree in chemistry or materials science.
Experience in the synthesis of inorganic and organic materials (mechanochemistry, "wet" chemistry, thermochemistry, etc.).
Experience in the field of electrochemistry is beneficial.
Sound verbal and written communication skills in English
To be a person who shows perseverance and commitment to gaining new knowledge.

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