Progress in materials development for Na-ion batteries

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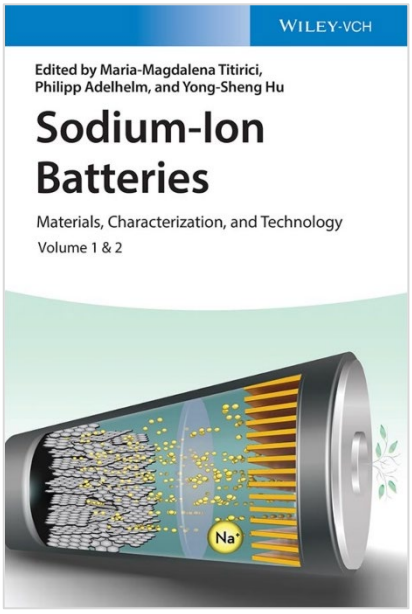
The rapid growth in battery demand, combined with resource issues and supply risks, raises questions about whether alternative battery technologies are needed that complement or partly replace lithium-ion and lead-acid batteries. A range of alternatives such as high temperature batteries or redox-flow systems are already available, with Na-ion batteries (SIBs or NIBs) being the latest contender.[1]

The main goal for SIBs is to develop batteries based on abundant, non-critical elements that reach, at the same time, similar energy densities compared to Li-ion batteries (LIBs). SIBs have the potential to be more cost effective than LIBs while reaching similar cycle life. As a major advantage compared to other alternative cell chemistries, SIBs can be produced on the same manufacturing lines like LIBs therefore taking advantage of existing manufacturing technology. Recent announcements by Chinese cell and car manufacturers are further raising the interest in this technology. In fact, the first Na-ion Gigafactory has opened in November 2022 in China and Chinese OEMs announced to implement SIBs in electric vehicles. This clearly shows that the technology is now reaching commercialization.



On the other hand, there are clear opportunities for further improvements in electrode materials and electrolytes to further advance the technology. This talk gives an overview on Na-ion batteries and recent developments. The state-of-the art will be summarized followed by a discussion on what materials can be used (and not used) compared to Li-ion batteries.

[1] SODIUM-ION BATTERIES:
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