RECHARGEABLE SOLID-STATE SODIUM BATTERIES

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Abstract

The emerging field of all-solid-state sodium batteries is an exciting use case for hydrides in green energy. Boron-hydrogen-based compounds such as $NaCB_9H_{10}$ show promising potential as solid-state electrolytes in next-generation batteries [1] and provide an alternative to traditional batteries using flammable liquid electrolytes [2]. Sodium provides a low-cost alternative to commercial lithium-ion batteries due to the abundance of sodium, while having a similar redox chemistry to lithium-ion batteries [3, 4].
This study utilizes Carba-*closo*-borate compounds as solid electrolyte in rechargeable battery systems, making way for the next generation of batteries' emergence. Intercalation-type cathodes are used, and the battery systems of interest are analyzed using methods such as powder X-ray Diffraction (PXRD), galvanostatic cycling (GC), and impedance spectroscopy (EIS), allowing for an in-depth analysis of the battery systems.

References

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Therese Kjær is a green energy enthusiast pursuing a Ph.D. in the field of solid-state batteries at the Interdisciplinary Nanoscience Center at Aarhus University. Therese strives to make a positive environmental impact, developing highly effective rechargeable batteries for the storage of renewable energy. Therese has a bachelor's degree in chemistry from University of Southern Denmark and specializes in cathode materials for rechargeable batteries.