Editorial for rare metals, special issue on solid state batteries

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Energy storage devices based on organic liquid electrolyte are still suffered from safety issues. Therefore, developing the solid state batteries based on solid electrolytes is an inevitable choice because of the high safety. However, the practical applications of solid state batteries have been still suffered from some drawbacks, including the low ionic conductivity at room temperature, narrow electrochemical window, and weak chemical/electrochemical stability of solid-state electrolytes, the dendrite on metal anodes, and poor interfacial compatibility between electrodes and electrolytes.

This special issue consists of nine original research articles and two review articles on the research of solid state batteries. In detail, it covers the design of polymer electrolytes and inorganic solid electrolytes. Also, the composite metal anodes and the interfacial modifications between anodes and solid electrolytes have been deeply discussed. Furthermore, the energy storage devices applications, such as solid-state lithium batteries, sodium batteries, lithium–oxygen batteries, lithium–air batteries, lithium–CO₂ batteries, and supercapacitors, are also included.

To date, there are mainly two key points that still to be solved for developing the solid state batteries: one is

fabricating solid-state electrolytes with high ionic conductivities at room temperature, and the other is how to construct the high-performance solid state batteries with intimate interfaces between solid electrolytes and electrodes. Aiming to these, new types of solid-state electrolytes, new methods for fabricating the electrolytes, and new techniques for building the solid state batteries are further to be explored. This journal will continue to offer more opportunities for publishing high-quality and high-impact papers in the research of solid state batteries.

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