

## Special topic on electrochemical power sources

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With the concurrent successes of lithium-ion batteries, supercapacitors and fuel cells during the last two decades, electrochemical devices that convert and store electric energy through chemical reactions have played a vital role in powering the modern industry. Driven by a raising demand from the emerging energy-dependent industries such as grid and electric automobiles, the pursuit of electrochemical power sources with higher energy density and efficiency, and better economic sustainability is always one of the most attractive topics in the field of chemistry for this century and beyond.

Under this theme, new storage systems that function differently from the conventional electrochemical power sources such as the “post-lithium” batteries and rechargeable sodium/potassium batteries have been proposed as promising candidates to match with the elevating energy consumption in the upcoming decade. Even in the conventional storage systems, evolution of key-enabling components and materials has brought new opportunities to improve the device performance. Many breakthroughs have been made, which continuously updates people’s understanding about the energy-related chemistry and more importantly, renders possibilities to remove the energy barrier in conventional storage systems and realizes new storage systems that were considered “impossible” in the past.

China, a country that has witnessed its prompt rise in the past years, is now facing ever-growing energy-related challenges as a result of the rapid economic growth. The development of advanced electrochemical power sources is expected to mitigate the energy shortage and facilitate the upgrade and structural transformation of the energy-related industries in China, which will also have a long-term impact on the energy picture worldwide. In this special topic, we are pleased to release some frontier works associated with the recent advancement in electrochemical storage devices in China, including lithium-ion batteries, lithium-sulfur batteries, lithium-oxygen batteries, sodium-ion batteries, potassium-ion batteries and fuel cells. The topic collects 8 contributions, including 5 original research articles and 3 review papers from the top China researchers in the field of electrochemical energy storage. Although the collection does not reflect all the recent progress in energy-related chemistry of China, we would like to take the opportunity to trigger a wide discussion on a broader context from both science and engineering communities, which we believe is beneficial to developing innovative technologies to address the energy challenges in China.

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