

Preface

Li-S and Li-O₂ batteries own super high specific energy, 2600 Wh/kg for Li-S battery and 13000 Wh/kg for Li-O₂, respectively, which is several times higher than that of the commercial Li-ion batteries. These batteries could enable the electric vehicles or unmanned aerial crafts to have longer driving range, as well as make it possible to manufacture lighter and smaller portable electric devices. Currently, the research of Li-S and Li-O₂ batteries is among the hottest topics in energy storage and they are deemed as the next-generation energy storage devices beyond the Li-ion batteries. Many countries, including China, Korea, Japan, British and the USA, all provide large amounts of research funding to promote the development of Li-S and Li-O₂ batteries.

During the past decades, the Li-S and Li-O₂ batteries have achieved great progress in both fundamental research and application demonstration, and the possible solutions to many technical problems have also been proposed. This book offers a comprehensive overview of the fundamentals, recent developments, challenges and prospects of Li-S and Li-O₂ batteries, including the fundamental research and potential applications. The book illustrates the cell assembly, diagnostic test and electrolyte decomposition mechanism of Li-S and Li-O₂ batteries, and focuses on the development of key materials of both batteries, including anodes, cathodes, electrolytes and separators. In addition, the future research directions of Li-S and Li-O₂ batteries are also pointed out in this book, with several suggestions to solve the tough problems that limit the development of Li-S and Li-O₂ batteries, such as the lithium dendrites and electrolyte decomposition. This book also studies the potential applications of Li-S and Li-O₂ batteries, together with their challenges and perspectives discussed.

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