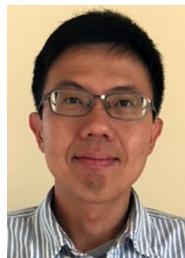


Atomic and Molecular Layer Deposition for Superior Lithium–Sulfur Batteries: Strategies, Performance, and Mechanisms



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The front cover artwork is provided by Meng's Nano & Energy Group at University of Arkansas, Fayetteville, AR 72701, USA. The image shows that atomic layer deposition (ALD) and molecular layer deposition (MLD) are two new research techniques enabling to address existing issues in Li–S batteries for high-energy storage used for future transportation and smart grids. Read the full text of the Review at 10.1002/batt.201800024.

What is the most significant result of this study?

Lithium–sulfur (Li–S) batteries are one of the most promising battery systems, enabling much higher energy density and much lower cost than those of state-of-the-art lithium ion batteries (LIBs). However, Li–S batteries still face many challenges that need to be resolved. In this work, we, for the first time, made a comprehensive review on the recent research progresses using atomic and molecular layer deposition (i.e. ALD and MLD) for high-performance Li–S batteries. This review is significant for disseminating the applications of both ALD and MLD in Li–S batteries and stimulating new research efforts.

Who contributed to the idea behind the cover and who designed the cover?

I (Prof. Xiangbo Meng) developed the idea and designed the cover. I was stimulated by the promises of Li–S batteries for supporting future transportation and smart grids. In particular, the success of Li–S batteries offering us a much cleaner and healthier environment.

What prompted you to investigate this topic/problem?

I (Prof. Xiangbo Meng) have been heavily involved in investigations of next-generation LIBs and new battery systems

beyond lithium-ions. I had worked in two US national laboratories for battery research. The advantages of Li–S batteries particularly interest me and thus prompt me to search viable technical solutions to existing issues in Li–S batteries and to investigate the underlying mechanisms. In addition, I have been using both ALD and MLD for smartly designing novel nanostructured materials. All these have prompted me to make the review on this topic.

What other topics are you working on at the moment?

My premier research lies in two areas, i) smart design of new functional nanomaterials using ALD and MLD and ii) investigation and development of new battery systems, including LIBs, Li–S batteries, sodium batteries, and other rechargeable alkali metal batteries. My research is also involved in surface engineering and catalysis.

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