

# 화학고 세미나

장지현 교수  
서강대 화학과

## Developing High-Energy-Density Solid-State Batteries From Materials to Cell-level, From Lab to Real Systems

All-solid-state batteries (ASSBs) are regarded as one of the next-generation technologies that can overcome numerous limitations present in conventional liquid lithium-ion batteries (LIBs) due to their extremely high safety. The comparable performance between the two stems from the development of solid-state electrolytes (SSEs) including sulfide-based SSE such as  $\text{Li}_6\text{PS}_5\text{Cl}$  which possesses an ionic conductivity equivalent to that of liquid electrolytes. However, several challenges must be addressed to achieve the practical application of ASSBs, such as the development of high-performance solid-state electrolytes, stable electrode electrolyte interfaces, and cost-effective manufacturing processes. This talk will focus on the state of ASSB research, including recent progress in solid-state electrolyte and cathode/anode materials, and cell architecture. In addition, we summarize the recent advancements and highlight the remaining challenges in ASSB research and the advanced cell fabrication processes including the scale-up manufacturing process. We also look into one of the promising alternatives for a highly cost-effective system, Na-ion ASSB, with an outlook on the future of this promising technology.

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