**Interfacial Stabilization of All-Solid-State Batteries**

Minjeong Shin

*School of Chemistry and Energy, Sungshin Women’s University*

*\*E-mail: mshin@sungshin.ac.kr*

**Abstract**

All-solid-state batteries are considered a promising technology due to its enhanced safety and high energy density compared to the current Li-ion battery systems. Despite such advantages, achieving high performance all-solid-state batteries is challenging due to poor interfacial properties at solid electrolyte/electrode interfaces.

To address challenges related to poor interfacial contact, we use the strategy of modifying the interface by employing the highly concentrated solvate electrolyte as an interlayer material at the electrolyte/electrode interfaces. The incorporation of the interlayer enhances the cyclability of the solid-state cell compared to the bare counterpart. Electrochemical impedance spectroscopy of the interlayer-modified cell shows a gradual decrease in interfacial resistance as a function of cycle number, whereas the cell impedance of the bare cell remains constant. The incorporation of solvate interlayer enhances the cyclability of the solid-state batteries by forming favorable ionic contact at battery interfaces.

Another way to modify the solid-state battery interfaces is to employ thin film deposition techniques to apply Li-ion conducting thin films at the solid electrolyte/electrode interfaces. We demonstrate the incorporation of thin film coating on solid electrolyte enhances the chemo-mechanical-electrochemical stability of the cell.