

세미나 초록

발표주제	Development of high performance perovskite p-type thin film transistors
발표내용	<p>In this talk, I would like to introduce a general overview and recent progress of our group of p-type metal halide and perovskite semiconductors for application of hole transport layer in light-emitting diodes and field-effect transistors (FETs). At the first part of the seminar, wide band gap p-type semiconductors, copper iodide (CuI) will be introduced. I will mainly address the electrical properties, band structure, and doping of those materials. As transparent p-type semiconductors, I provide our results for CuI and doped CuI which exhibited impressive hole mobility over $5 \text{ cm}^2/\text{Vs}$ and high transparency in visible region. In addition, the main challenges for commercialization will be discussed. After then, I will talk about the tin based 2D and 3D perovskite semiconductor as promising p-type halides. I will introduce inorganic perovskite thin-film transistors with exceptional performance using high-crystallinity and uniform cesium-tin-triiodide-based semiconducting layers with moderate hole concentrations and superior Hall mobilities, which are enabled by the judicious engineering of film composition and crystallization. The optimized devices exhibit high field-effect hole mobilities of over $50 \text{ square centimeters per voltage-second}$ and large current modulation greater than 10^8, as well as high operational stability and reproducibility [1].</p> <p>Reference</p> <p>(1) Ao Liu, Yong-Young Noh et al, Nature Electronics, 5 (2), 78-83 (2022)</p>