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Raman Studies on Hybrid Organic-inorganic Perovskites and Conductive Polymers by Using Ultra-low Frequency Detection and Large Area Mapping

Raman spectroscopy is one of the most widely used in chemical analyses, as it offers chemical fingerprints which are highly sensitive to the chemical structures of the analytes. In particular ultra-low frequency Raman spectroscopy provides unique information on slowly oscillating intermolecular vibrations and phonon modes, especially in organic and inorganic crystalline lattices, which highly impact their device performances. In addition, the large-area Raman mapping technique is also beneficial to study spatially resolved crystalline phases and morphological information which are highly related to optical and electrical performances of materials.

In this seminar, our recent large-area Raman map and ultra-low frequency Raman results will be presented with basic introductions to Raman spectroscopy. The materials are organic-inorganic halide perovskite thin film (methylammonium lead iodide, MAPbI₃) and quantum dots (MAPbI₃, Cesium lead bromide (CsPbBr₃) and Cesium tin_x lead_{1-x} bromide (CsSn_xPb_{1-x}Br₃). In addition, Raman results of the conductive polymer thin films (Poly(3,4-ethylene dioxythiophene):poly(styrene sulfonate (PEDOT:PSS)) and poly(3-hexylthiophene-2,5-diyl (P3HT))) will also be presented.

References

- (1) M. Park, et al. *Nano Lett.* **2017**, *17*, 4151-4157.
- (2) N. Kim, et al., *Adv. Mater.* **2014**, *26*, 2268-2272.
- (3) M. Shin, et al. DOI:10.1002/bkcs.12704

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