

Red-shifted Electroluminescence from Layered Mixed Halide Perovskite Results from Anion Migration and Selective Charge Injection

나윤서, 김동하[†]
이화여자대학교
(dhkim@ewha.ac.kr[†])

There have been several reports about the spectral shifts in electroluminescence from devices based on mixed halide perovskites, but still there is a limited understanding regarding the fundamental reason for their spectral instability. Herein, we propose a novel mechanism for the red-shifting behaviors of light-emitting diodes based on layered mixed halide perovskites. We investigated layered perovskites with various iodide/bromide ratios and found that all these perovskites emit red-shifted light during the device operations. Our study reveals that the red-shifting rates of electroluminescence are largely dependent on the ion drift velocities. In addition, anion migrations result in the formation of bromide- and iodide-rich regimes under the electric field. We also found that this halide phase redistribution gives rises to the changes in charge transfer process by suppressing the hole injection into the certain domain, causing the red-shifted electroluminescence. This study will provide new insights into the mechanism of spectral instability of mixed halide perovskites.