Highly Stable Mixed-Cation $Cs_xRb_{1-x}PbX_3$ Perovskite Qauntum Dots and Their Full-Color Film with Wide Color Gamut

백승민[1,2], 서해운[1,2], 김용진[1,2], 손채연[1,2], 김상욱[1,2,†]
[1]아주대학교; [2]분자과학기술학과
(swkim@ajou.ac.kr[†])

In recent years, perovskite quantum dots(PeQDs) have received a lot of attention for many application. however, PeQDs were unstable and the optical properties were readily degraded because of its structural instability. To overcomes these problems, We applied to perovskite using other cations. Mixed-cation $Cs_xRb_{1-x}PbX_3$ (X = Cl, Br, I) perovskite quantum dots (PeQDs) are developed and show high quantum yields of 93% and 86% for green and blue wavelengths, respectively. The stability is significantly improved under heat, UV, and water aging conditions. We also fabricated the film by applying cyclic olefin copolymer to perovskite for the first time. The films have a wide color gamut covering up to 104.15% of the BT.2020-defined color space, with the white light color coordinates of (0.33, 0.32), luminance of 68.86 Cd/m^2, and correlated color temperature of 5299 K at 20 mA