Electronic Supplementary Material (ESI) for RSC Advances.

Effect of doping on the Phase Stability and Photophysical Properties of $CsPbI_2Br$ Perovskite Thin Films

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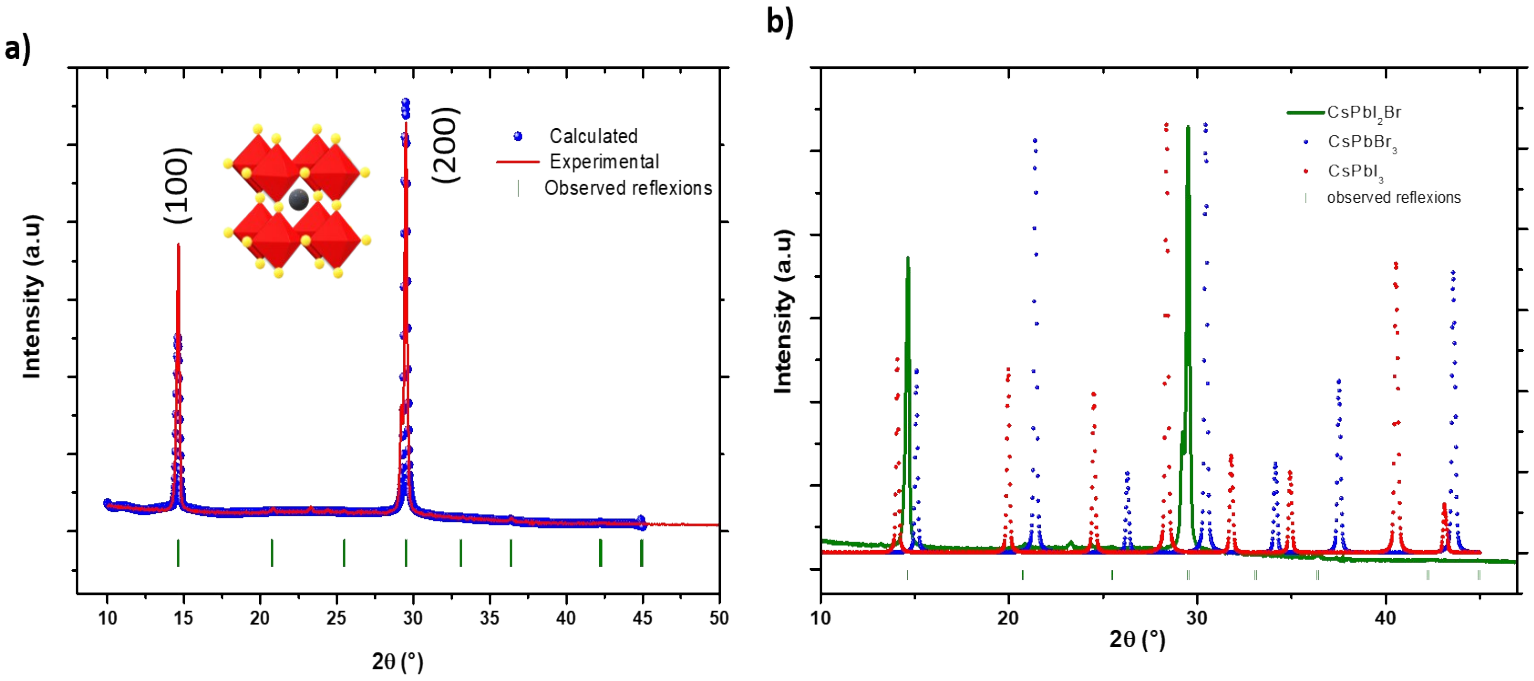
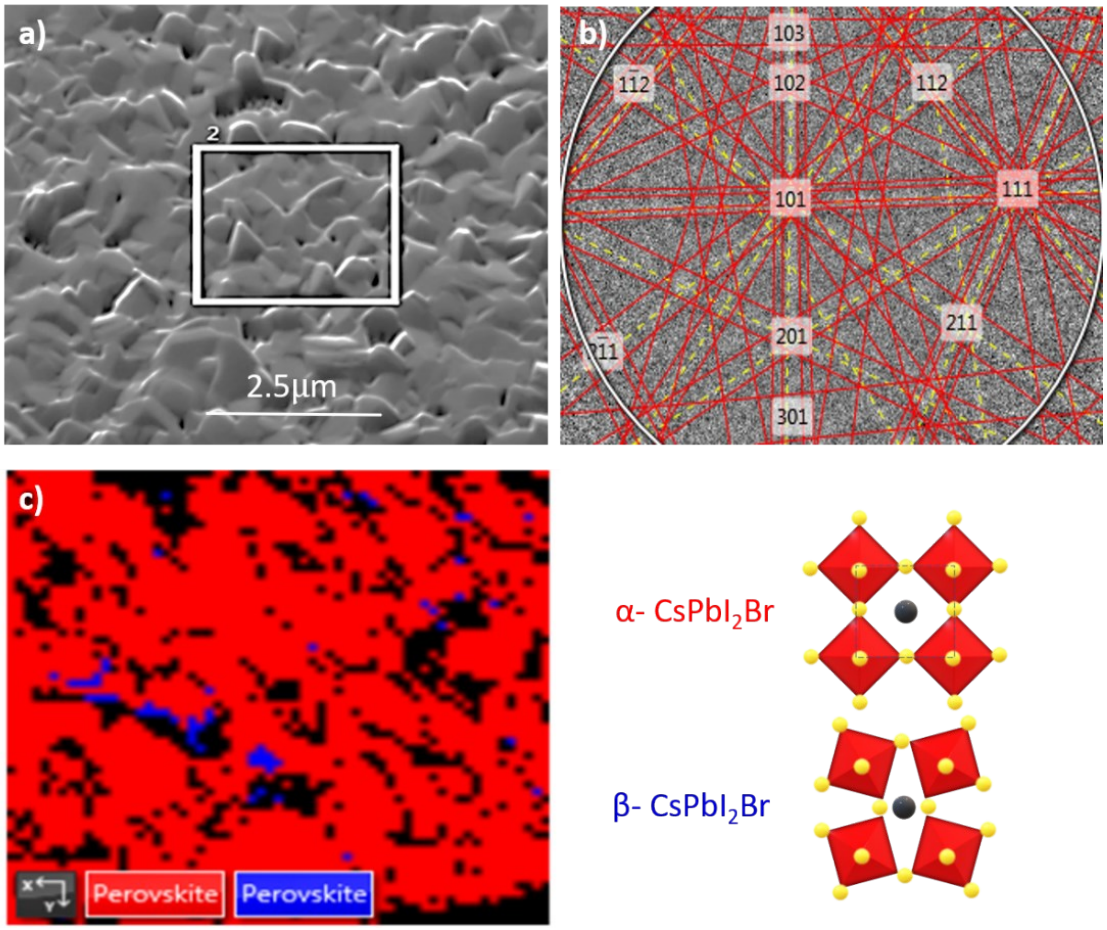
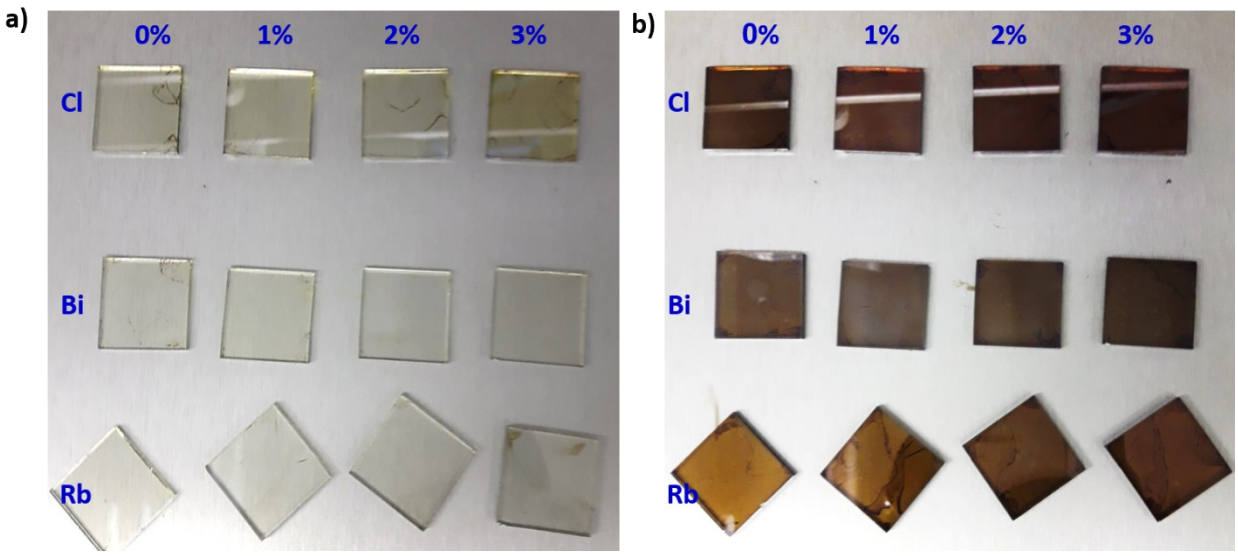


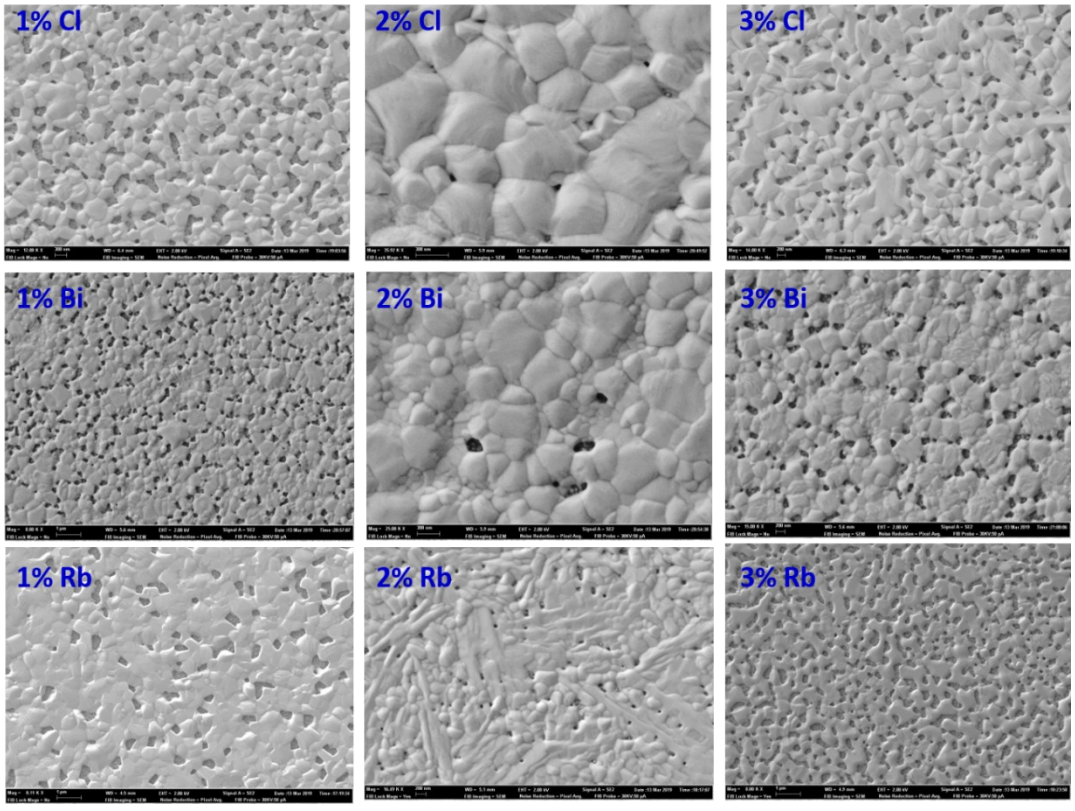
S.1 a) Experimental and calculated XRD pattern of the spin coated $CsPbI_2Br$ films **b)** Experimental XRD pattern of $CsPbI_2Br$, $CsPbI_3$ and $CsPbBr_3$.



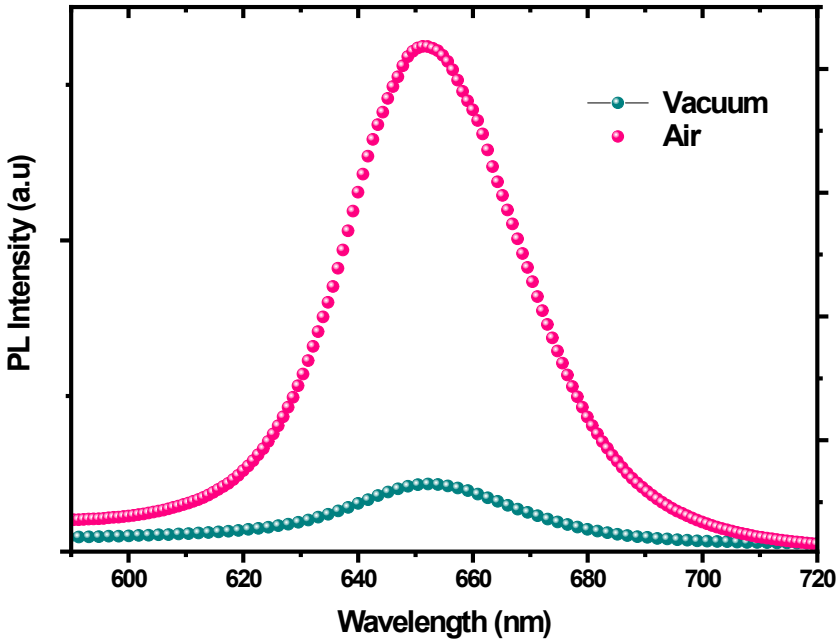
S.2 a) Scanning electron microscope (SEM) image of $CsPbI_2Br$ thin film tilted at 70 **b)** representative sharp Kikuchi diffraction lines of $CsPbI_2Br$ thin film collected in traditional electron backscatter diffraction (EBSD) geometry at 20 kV accelerating voltage **c)** Inverse pole figure (IPF) map generated from EBSD of CsPbI2Br thin film with IPF color key of the two perovskite phases α-$CsPbI_2Br$ and β-$CsPbI_2Br$



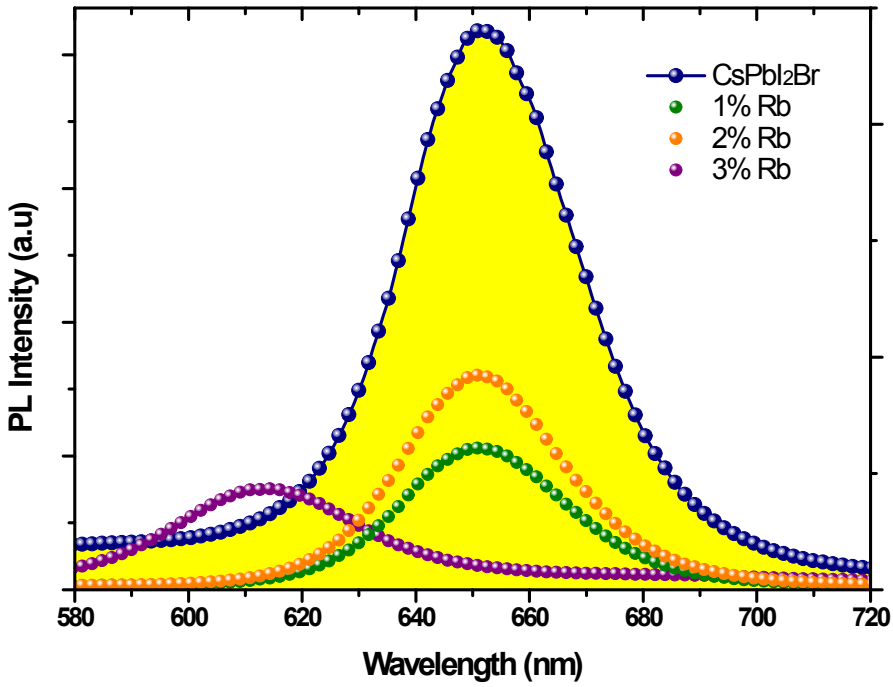
S.3 The visually image of dark brown colored phase of $CsPbI_2Br$ films synthesized in this work during different phases of thermal annealing: **a)** After 1 min at 60 ºC, **b)** after 10 min at 180 ºC.



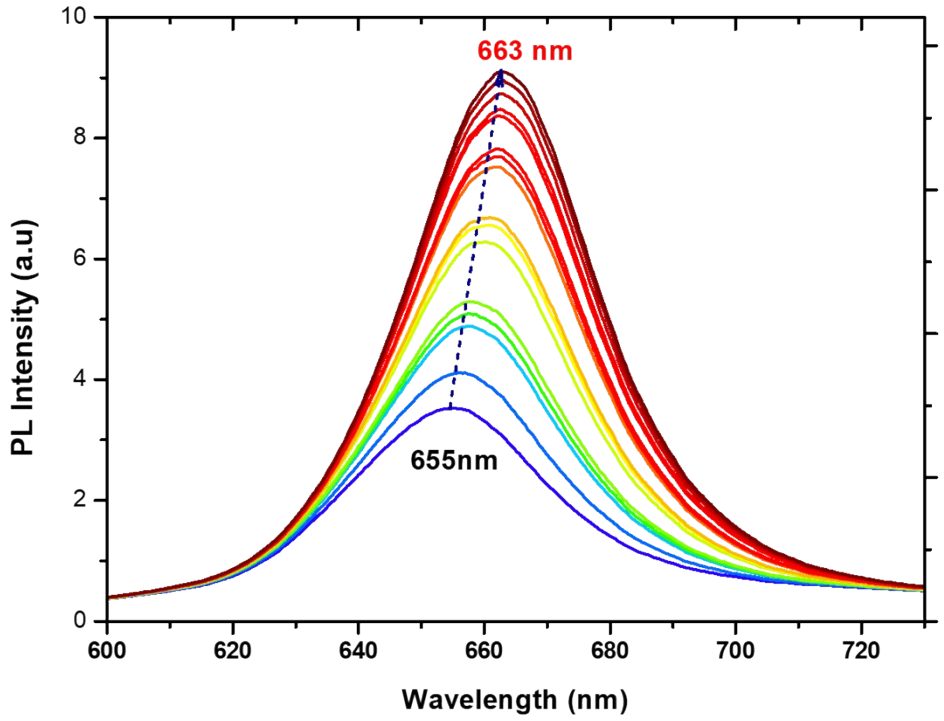
S.4 SEM images of different $CsPbBr_2I$ doped with Cl, Bi and Rb with different concentration



S.5 PL spectra of Rubidium doped $CsPbI_2Br$ films with different Rb percentage.



S.6 PL spectra of $CsPbI_2Br$ films with different in vacuum and in ambient air.



S.7 PL spectrum of $CsPbI_2Br$ film under continuous laser illumination