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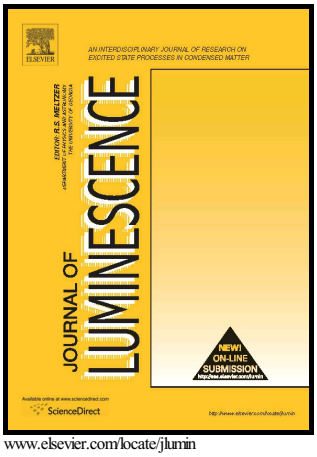

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Abstract

Segregation is an effect observed when $CH_3NH_3Pb(I_{1-x}Br_x)_3$ mixed perovskites are illuminated with photon energy greater than their band gap. It is concerned to the formation of low band-gap I-rich domains that constitute attractive centers for the recombination of photogenerated electron-hole pairs, causing a significant red-shift of photoluminescence of the material with consequences for the operation of optoelectronic devices, such as light emitting diodes and photovoltaic cells. This effect is commonly observed as reversible, with a spontaneous remixing of the halogens occurring when the material is left in the dark. While the segregation process is already relatively well documented in the literature, much less attention has been paid to the causes and understanding of the remixing process. In this work are presented results that demonstrate the strong dependence of the remixing with the pressure to which the material is submitted. When the perovskite film is subjected to low pressure, it is noticed that the maximum displacement of PL during the dark time is significantly lower than in the case of the film at ambient pressure, indicating that under low pressure the remixing process is hampered. The dependence of the remixing process with the pressure can be used in new hybrid perovskite applications, such as in photoinscription to memory storage.

Keywords: Perovskite films, photoluminescence, pressure, halide segregation.