Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

ELECTRONIC SUPPIMENTARY INFORMATION

New insights on exciton binding and relaxation from high time resolution ultrafast spectroscopy of $CH_3NH_3PbI_3$ and $CH_3NH_3PbBr_3$ films

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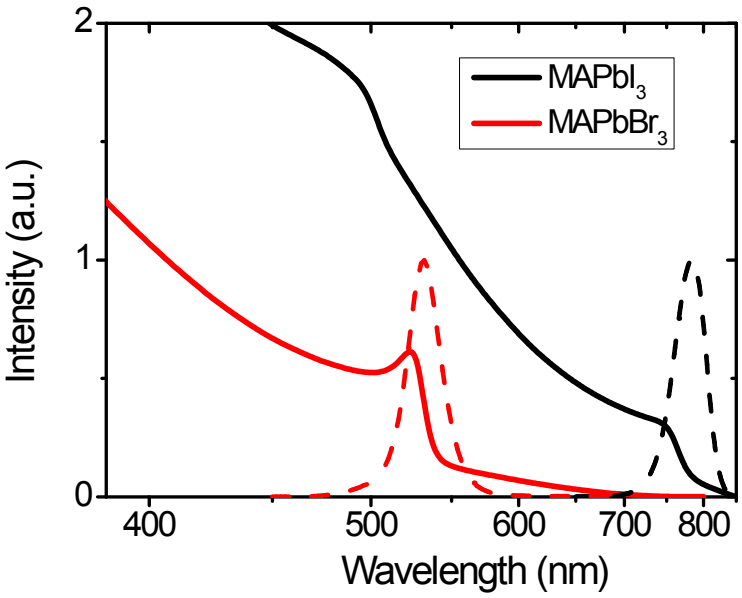

Figure S1. Absorption and photoluminescence of the two samples studied. (PL) was measured on an Edinburgh Instruments FLS920 fluorimeter equipped with a film holder. Samples were excited using Fianium SC400 laser output monochromatized at 405 nm (MAPbBr3) or at 500 nm (MAPbI3). The emission from the sample was collected at a right angle, through long pass filter and a monochromator to suppress the scattering from excitation source, and collected using a Hamamatsu H10720 high speed PMT.

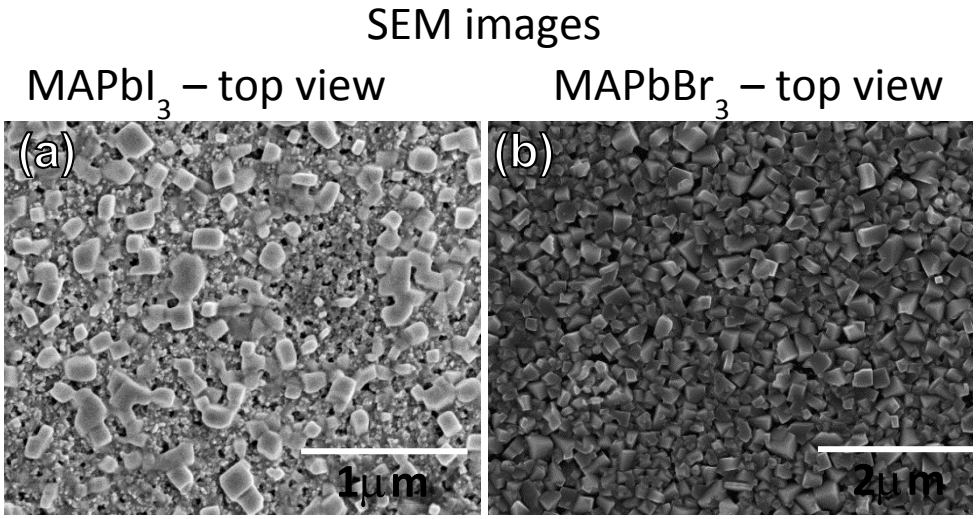

Figure S2. SEM images of the samples.