Photoinduced Iodide Expulsion from Mixed Halide Perovskites

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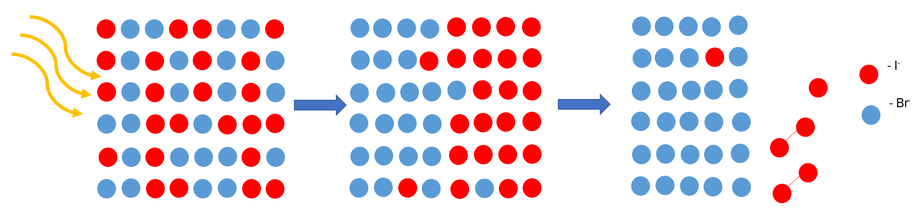
Introduction

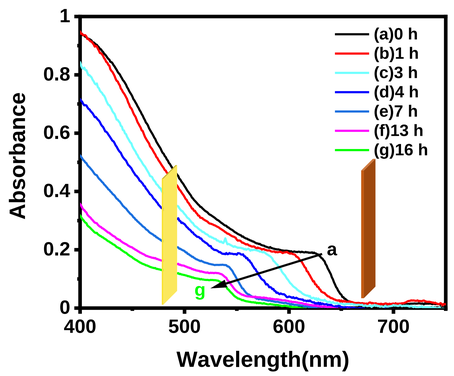
- Mixed halide perovskites segregate under photoirradiation
- Iodide is expelled into solvent upon electrochemical hole injection
- Would photoinduced holes cause iodide expulsion in solvents ?

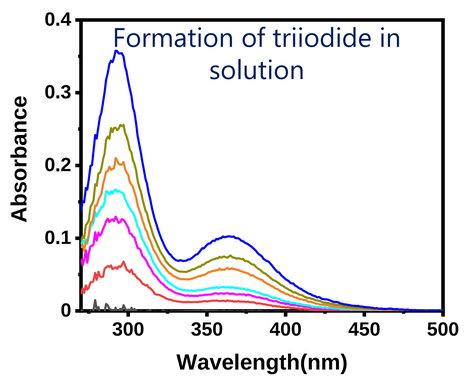
Methods

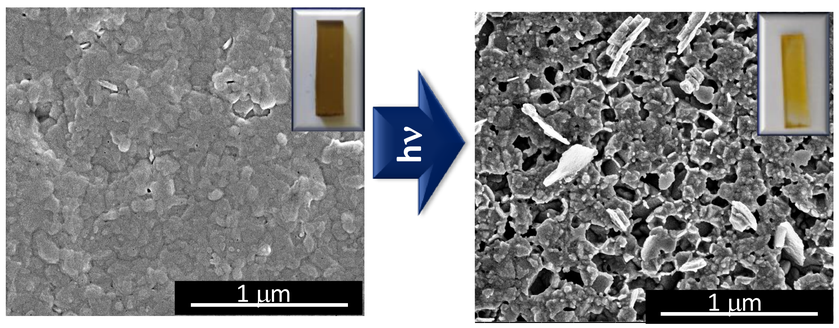
- $MAPbBr_{1.5}I_{1.5}$ films were immersed in DCM
- Films were irradiated using a white light source with 1 Sun irradiation
- For Quantum efficiency calculations, a 405nm laser was used for irradiation



Mixed halide perovskites expel iodide into solution on photoirradiation







Results

- Blue-shift in band edge absorbance with time
- Final absorbance corresponds to $MAPbBr_3$
- Iodide is expelled into solvent as I_3^-
- Quantum Efficiency of iodide
  number of triiodide (n_I) = Abs/εl
  number of photons(n_{ph})= (Power/E_g)/ N_A
  Q.E. = n_I/n_{ph}
  =2.2 x 10^{-4}%
- SEM images show formation of pinholes implying loss of species

References

1. *J. Am. Chem. Soc.* 2019, 141, 27, 10812-10820