

Abstract Submitted
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Optical studies of photoactive states in mixed organic-inorganic hybrid perovskites stabilized in polymers¹ BEATA KARDYNAL, LIFEI XI, PGI 9, Forschungszentrum Julich, Germany, TEDDY SALIM, MSE, NTU, Singapore, SVEN BORGHARDT, TOMA STOICA, PGI 9, Forschungszentrum Julich, Germany, YENG MING LAM, MSE, NTU, Singapore — Mixed organic-inorganic hybrid perovskites MAX-PbY₂(X,Y=I, Br,Cl) have been demonstrated as very attractive materials for absorbers of solar cells and active layers of light emitting diodes and optically driven lasers. The bandgap of the perovskites can be tuned by mixing halogen atoms in different ratios. In this presentation we study mixed MAX-PbY₂(X,Y=I, Br, Cl) particles synthesized directly in protective polymer matrices as light emitters. Both, time integrated and time resolved photoluminescence have been used to study the materials. So synthesized MAX-PbX₂ are very stable when measured at room temperature and in air with radiative recombination of photogenerated carriers as the main decay path. In contrast, MAX-PbY₂ with mixed halogen atoms display luminescence from sub-bandgap states which saturate at higher excitation levels. The density of these states depends on the used polymer matrix and increases upon illumination. We further compare the MAX-PbY₂ synthesized in polymers and as films and show that these states are inherent to the material rather than its microstructure.

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Beata Kardynal
PGI 9, Forschungszentrum Julich

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