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## Optoelectronic studies on hybrid perovskites films for solar cells applications

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Novel materials have been developed for overcoming the challenge of solar cells with low cost and high efficiency. Recently hybrid perovskites  $ABX_3$  [ $A=CH_3NH_3^+$ ,  $CH=CHNH_3^+$ ;  $B= Pb^{+2}$ ,  $Sn^{+2}$ ;  $X=I^{-2}$ ] solar cells have reached high power conversion efficiencies i.e. above 20% using simple manufacture methods and low temperature deposition, which have generated great interest in scientific-technological areas for the commercialization. Perovskites solar cells (PSCs) could compete respect to silicon technologies however present critical issues in thermal stability under external factors (moisture, light-oxygen, heat) as well as lack of reproducibility in fabrication methods. This work is focused on structural- optoelectronic studies on  $CH_3NH_3PbI_3$  to understand the interface influence on the degradation process. The  $CH_3NH_3PbI_3$  films were realized by one-step spin coating and characterized by X-ray diffraction and photoluminescence PL. The films showed a smooth surface with excellent cover on glass and high PL like have been reported in previous works. We prepared solar cells (ITO/PEDOT:SS/ $CH_3NH_3PbI_3$ /PCBM/Al) and measured current-voltage (J-V) and electrochemical impedance spectroscopy (EIS). Important differences were observed in rapid and low process (frequency) when the devices were put under illumination before IS measurements. Significant structural changes were observed by XRD. Optical studies reveal degradation mechanisms, which they are going to discuss.

### Biography

M Solis de la Fuente has done his PhD from UNAM Mexico. He is currently a Post-doctoral student at LBNL, California, United States. His areas of interest are renewable energy, solar cells, light emitting diodes (LEDs), metallic oxide and semiconductor quantum dot synthesis, optoelectronic characterization hybrid perovskites, and thin films growth.

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