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Electrical characterization of the light induced degradation in CH₃NH₃PbI₃ thin film BIZUNEH GEBREMICHAEL DIFER, Physics Department, Addis Ababa University, Addis Ababa, P.O.Box 1176, Ethiopia, GENENE TESSEMA MOLA, School of Chemistry Physics, University of KwaZulu-Natal, Pietermaritzburg Campus, Private Bag X01, Scottsville 3209, South Africa, SENTAYEHU YIGZAW, Physics Department, Addis Ababa University, Addis Ababa, P.O.Box 1176, Ethiopia — Recently, organic metal halide perovskites have emerged as one of the most promising photoactive materials in the field of photovoltaics. Different reports shows that CH₃NH₃PbI₃ based perovskite solar cells (PSCs) have got a power conversion efficiency of up to 20%. However, Perovskites suffer inherent instability and degrade rapidly when exposed to an ambient operating atmosphere which limits their further application to commercialization. Several studies have been carried out to resolve this problem to some extent. Proper encapsulation of the device prevents from degradation due to moisture and oxygen. However, degradation due to light irradiation is difficult to manage. Recent studies demonstrated that in the steady state operation of the device, the Voc is unchanged by continuous illumination of light. Rather the reduction in the power conversion efficiency follows the trend of the Jsc. In this work, the effect of light on the electrical conductivity of the CH₃NH₃PbI₃ thin film which is deposited on a glass substrate is investigated using a four point probe conductivity measurement. Further, the temperature dependent conductivity measurement demonstrated that the dominant conduction type in the film is electronic rather than ionic type.

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