Supporting Information

Effect of PCBM nanoparticles in Lead-based Layered $(PEA)_2PbI_4$ Perovskite Thin Films

Deepak Aloysius, [†] Muskan Khan, [†] Arindam Mondal, [†] Satyajit Gupta*[†]

[†] Department of Chemistry, Indian Institute of Technology Bhilai, Durg, Chhattisgarh, 491002

*Corresponding Author

Email: satyajit@iitbhilai.ac.in

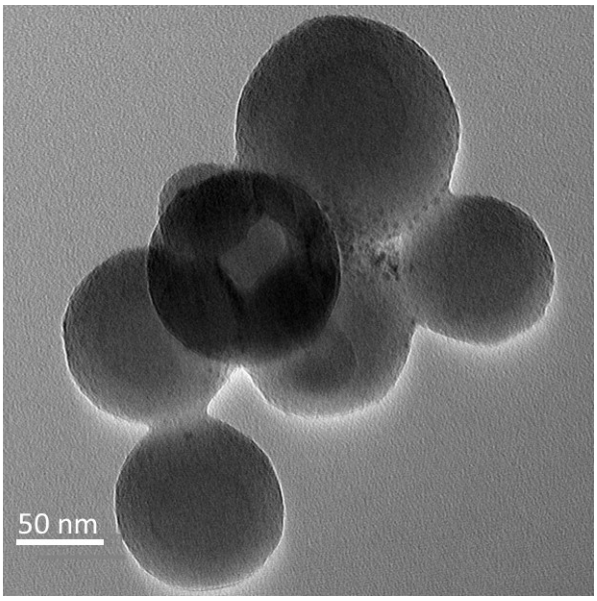

Fig. S1: TEM images of PCBM dispersed in DMF: DMSO solvent.

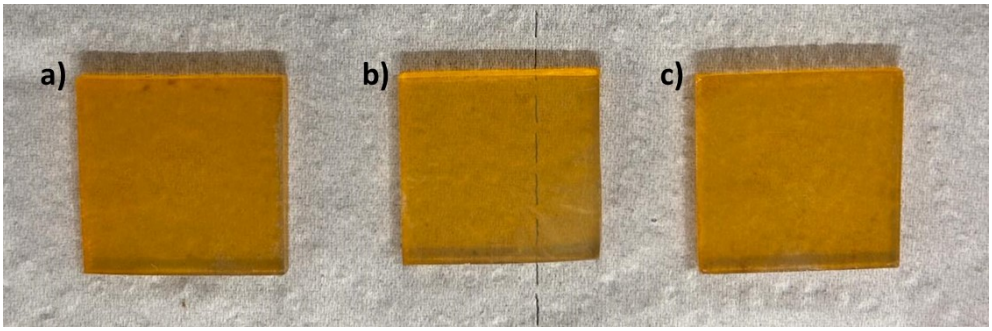

Fig. S2: Optical photographs of a) P_0, b) $P_{0.5}$ and c) $P_{0.75}$ thin film compositions fabricated over FTO substrates

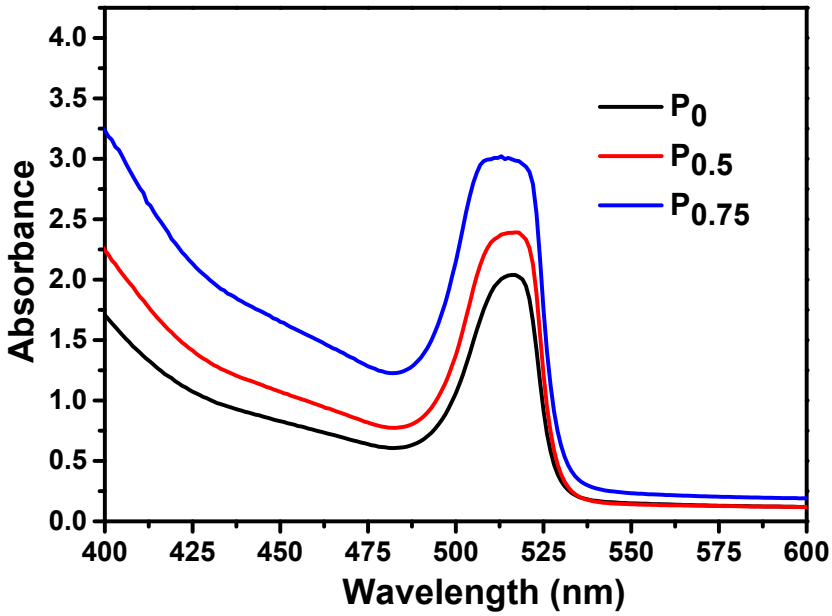

Fig. S3: Absorbance analyses of P_0, $P_{0.5}$, and $P_{0.75}$ compositions

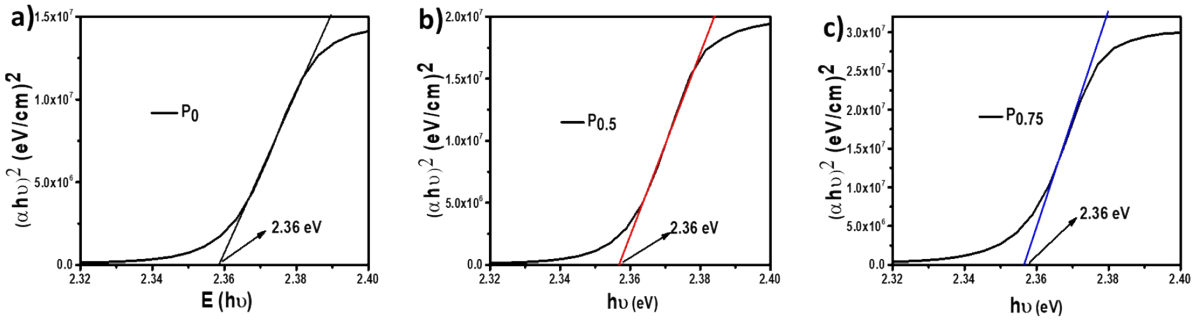

Fig. S4: Tauc plot analyses of a) P_0, b) $P_{0.5}$, and c) $P_{0.75}$ compositions

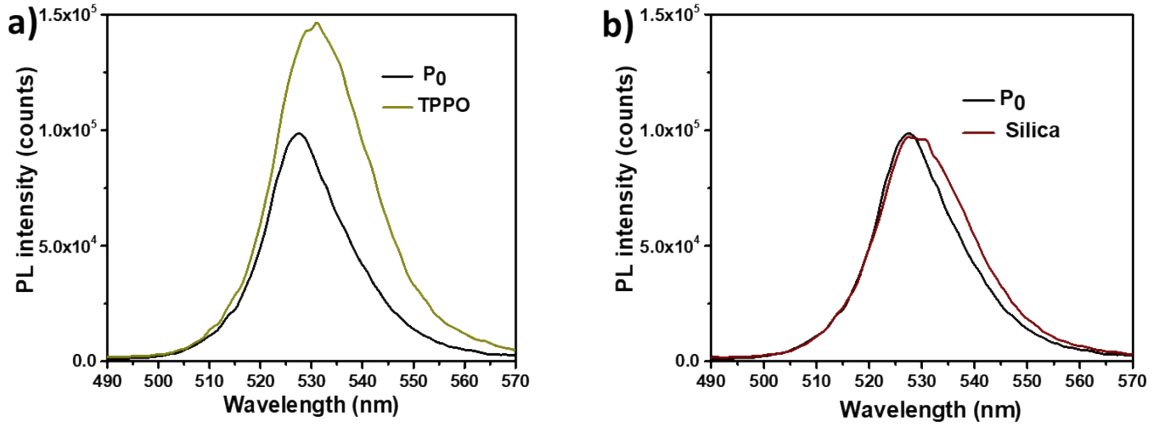

Fig. S5: SSPL data of a) TPPO mixed $(PEA)_4PbI_4$ and b) Silica mixed $(PEA)_2PbI_4$ in comparison with pristine $(PEA)_4PbI_4$.

Perovskite	T1 (ns)	T2 (ns)	Chi sq.
P_0	0.208	0.859	1.46
$P_{0.5}$	0.182	0.692	1.48
$P_{0.75}$	0.173	0.767	1.15

Table S1: TRPL curve fitting data of P_0, $P_{0.5,}$ and $P_{0.75}$ compositions

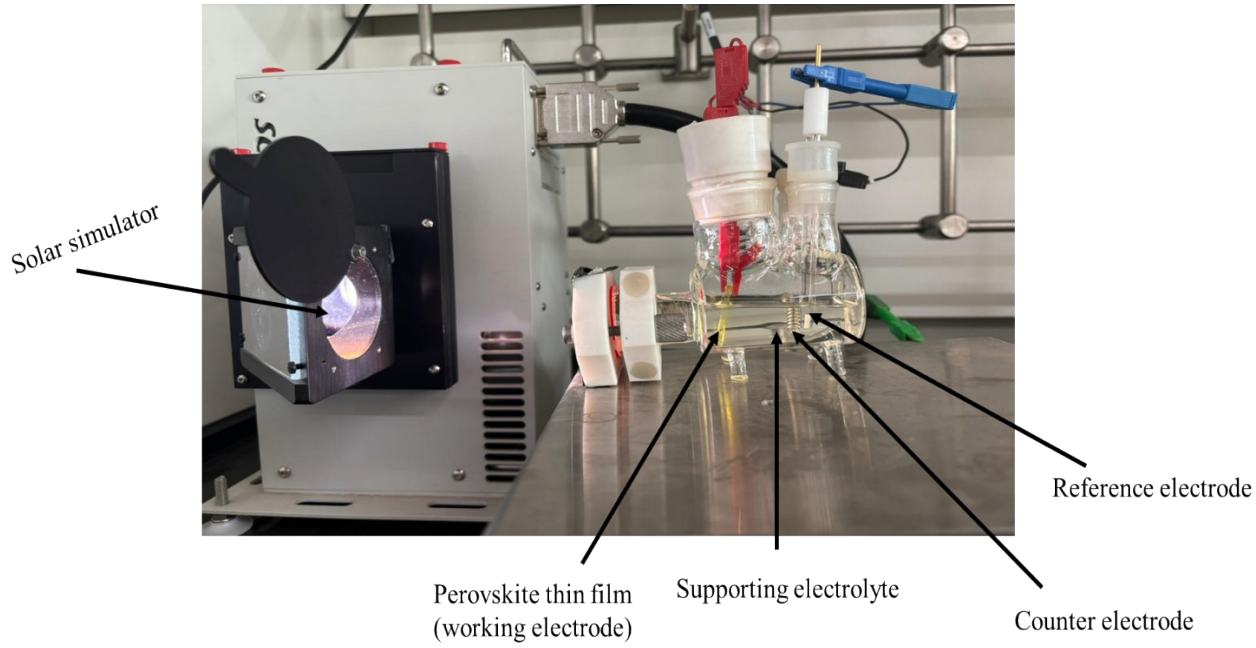

Fig. S6: Photoelectrochemical reaction setup

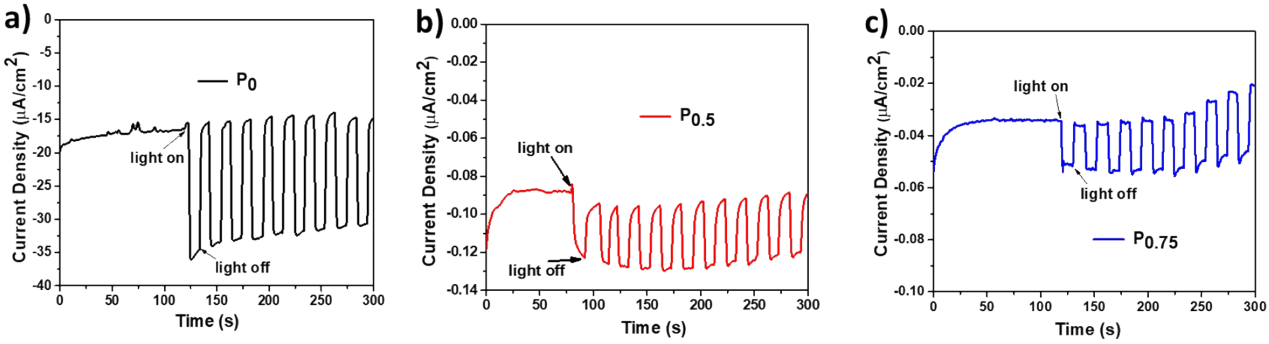

Fig. S7: The chronoamperometric curves (without c-TiO_2 layer) of a) P_0, b) $P_{0.5}$, and c) $P_{0.75}$ thin film compositions

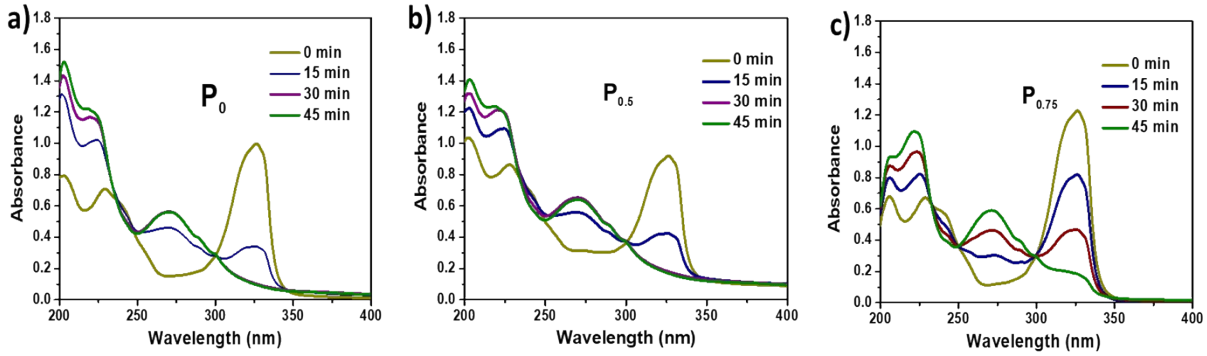

Fig. S8: The absorption curve of MBT dye at 15-minute intervals when a) $P_{0,}$ b) $P_{0.5,}$ and c) $P_{0.75}$ thin film compositions were used for photocatalysis.

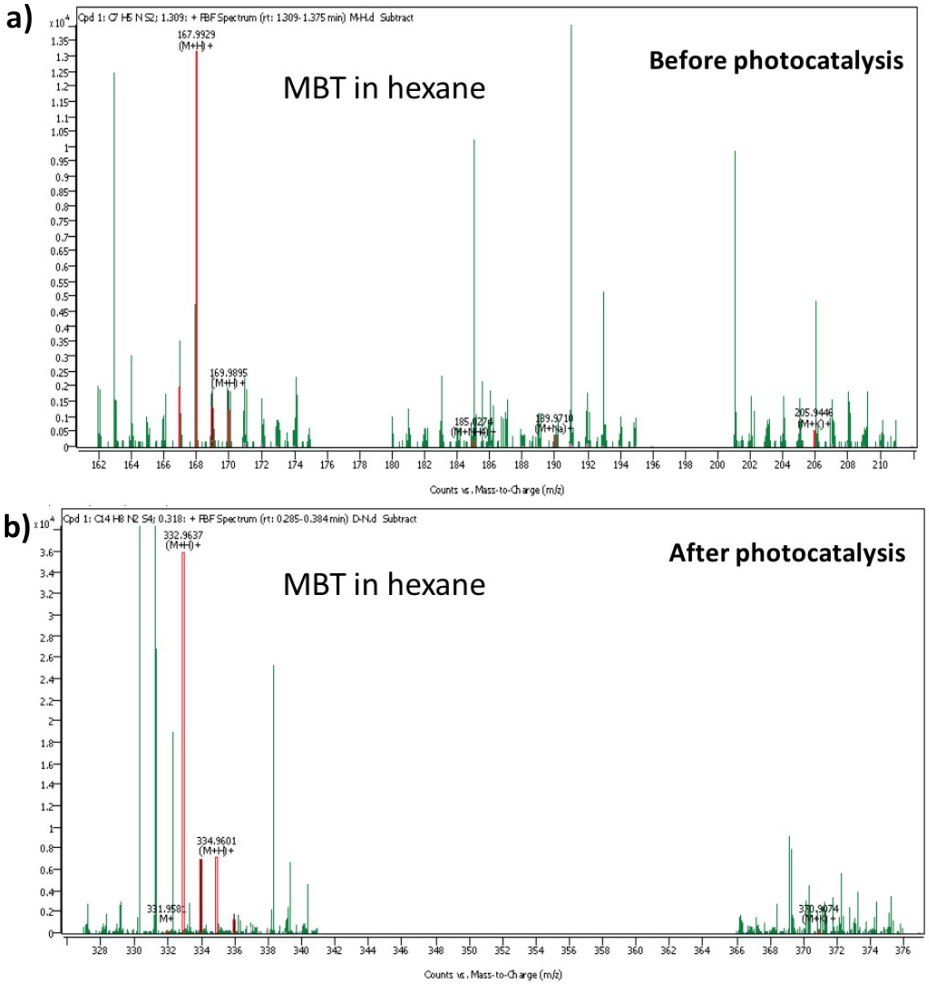

Fig. S9: ESI-MS data of MBT dye in hexane a) before photocatalysis (peak identified at m/z=167.9929 corresponds to the MBT) and b) after photocatalysis (the new peak observed at m/z = 332.9636 corresponds to the MBTS).