## Synthesis and Characterization of Tin dioxide (SnO<sub>2</sub>) Electron Transport Layer for Next Generation Flexible Solar Cells and Modules

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The electron transport layer (ETL) is one of the significant charge transport layers in the perovskite solar cells (PSCs). Tin dioxide (SnO<sub>2</sub>) demonstrates exceptional potential as an electron transport layer (ETL) in low-temperature processed perovskite solar cells, offering high electron mobility and compatibility with the flexible substrates. In this work, we report an easy and cost-effective method for synthesis of SnO2 colloidal dispersion through refluxing process at 85°C for three hours. The synthesis was followed by deposition of SnO<sub>2</sub> on glass substrates through spin coating. The deposited layers were tested for structural and optical properties using X-ray Diffractometer and Spectrophotometer. The high intensity diffraction peaks at 29° confirm the crystalline structure of the synthesized ETL. Further, the transmittance of around 90% in the visible range (400-800nm) clearly depict the satisfactory optical performance. The significance of this work lies in the fact the SnO<sub>2</sub> has been synthesized at temperature below 200°C, thus can lead to the development of next generation flexible solar cells and modules.