Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad – 500 046

Internal Webinar

Interface engineering of Perovskite & ETL/HTL for highly efficient and stable perovskite solar cells

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Organic-inorganic metal halide perovskite solar cells (PSCs) offer high power conversion efficiency (PCE) and cost-effective fabrication but face stability and degradation challenges. Surface defect passivation with monoethanolamine (MEA) enhanced PCE from 12.66% to 15.73%, retaining 77% efficiency after 1000 hours. Phenethylammonium chloride (PEACl) further improved PCE to 17.40%, with devices maintaining 71%-73% efficiency. Aluminium oxide nanoparticles (Al_2O_3-NPs) boosted PCE in inverted PSCs, achieving 14.72% for small and 9.2% for large areas, retaining 79% and 74% efficiency after 2000 hours. SiO_2 encapsulation ensured stability under water and outdoor conditions, retaining up to 88% efficiency. These strategies demonstrate effective passivation and enhanced PSC performance.

Thursday, Jan 9th 2025

11:30 Hrs