

IMPORTANCE OF INTERFACES IN HYBRID PEROVSKITE SOLAR CELLS

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Photovoltaic devices based on hybrid organic-inorganic perovskite absorbers have reached outstanding performance over the past few years, surpassing power conversion efficiency of over 22%. In this talk we discuss the role of the interface in optimizing device performance as measured by both power conversion efficiency and stability. We present an examination of different perovskite active layers and interfacial electronic structure of these remarkable materials with functional oxide and organic contact layers. Interface formation of the active layer with different carrier transport materials has direct implications for performance of the resulting devices. We present interface studies, which permit identification of charge transfer mechanisms across the interface with chemical specificity and insight into the requirements for realizing high performance devices. Our findings from surface science approaches are combined with time resolved spectroscopy, structural studies and device level studies to validate impacts on carrier dynamics and demonstrate their technological relevance of interfacial insights.