



Contribution ID: 44

Type: **Poster**

Interfacial structure and dynamics for PbS quantum dot solar cells

Wednesday, December 8, 2021 10:30 AM (1h 30m)

Colloidal quantum dots (CQDs) have generated great interest in various optoelectronic devices because of their size-tunable bandgap, low-temperature solution processability. Lead sulfide (PbS) CQDs, with a strong absorption coefficient and large Bohr radius, enable solar cells to harvest infrared photons of the solar spectrum beyond the absorption edge of crystalline silicon and perovskites. There have been many strategies to improve device performance, among which interface engineering is a promising method. Excellent interface engineering is designed to form an energy cascade to enable an efficient charge transfer and promote exciton dissociation. Moreover, it can also offer good interfacial contact and improve device air stability by selecting appropriate materials. Here, we sputter the indium zinc oxide (IZO) as the interlayer between PbS QDs absorption layer and ZnO nanoparticle (NP) electron transport layer (ETL), to fabricate PbS QD solar cells and study the trap densities and charge transport process at QDs interfaces. In addition, we also study the dynamics process of how the IZO is sputtered on the ITO glass and ITO/ZnO respectively.

Primary authors: ZHONG, Huaying; MÜLLER-BUSCHBAUM, Peter (1 Technische Universität München, Fakultät für Physik, Lehrstuhl für Funktionelle Materialien, James-Franck-Str.1, 85748 Garching, Germany 2 Heinz Maier-Leibnitz-Zentrum (MLZ), Technische Universität München, Lichtenbergstr. 1, 85748 Garching, Germany); CHEN, Wei (Technische Universität München)

Presenter: ZHONG, Huaying

Session Classification: Poster Session II

Track Classification: Material Science