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High-efficiency organic photovoltaics: Current and beyond

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Organic photovoltaics (OPV) has become a promising alternative energy due to the light-weight property and environmental friendliness. In the past 20 years, its stabilized power conversion efficiency increases from less than 1% to higher than 10%, which is a remarkable accomplishment. The fundamental science inside the OPV device is thus an interesting and meaningful topic. To incorporate more innovative ideas to this growing field, the history of OPV development and the design strategies for improving the efficiency will be introduced in the first part of this topic. We are also going to present the works of the most updated world record-breaking OPV, which are designed by the UCLA team and certified by National Renewable Energy Laboratory. In the second part, we like to discuss the new and thriving trend for organic photovoltaics: high performance transparent organic PV (TOPV). Transparent photovoltaics, including building-integrated PV and agriculture-integrated PV, are recently receiving more attention due to their unique potential in future applications beyond just harvesting solar energy. TOPV, which is a branch of transparent PV, has several intrinsic superior physical and chemical properties for achieving transparency and further application. In order to stimulate more creative thinking in the transparency module and its application, our new works and discussion of advanced TOPV will be presented.

Biography

Sheng-Yung Chang is a fourth-year PhD candidate in the Department of Materials Science and Engineering, UCLA. His research interest focuses on organic electronics, including organic photovoltaics, light emitting diode, and sensor. He has been awarded the MOE Technologies Incubation Scholarship for 3 years and Enli-Tech Scholarship for 1 year for his excellent research performance. He has published more than 15 papers as first author or co-author in SCI journals as of November 2018.

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