

Charge Generation and Charge-transfer States in Organic Solar Cells

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The power conversion efficiency of organic solar (OSCs) has increased from around 1% to over 10% in the past two decades. In spite of the great success in device efficiency, many fundamental issues concerning basic operational mechanisms of these devices remain unknown or controversial, limiting rational design of donor and acceptor materials. Among others, charge generation might be the most fundamental yet most debated issue. In this presentation, I will talk about our recent work, employing temperature-dependent open-circuit voltage measurements and highly sensitive charge-transfer state measurements, to understand the effects of different parameters (e.g. temperature, energetic disorder, *etc.*) on charge generation of OSCs.^[1,2]

References

- [1] Gao F., Tress W., Wang J., Inganäs O., “Temperature Dependence of Charge Carrier Generation in Organic Photovoltaics”, *Physical Review Letters*, Vol. 114, (2015), pp 128701.
- [2] Gao F., Himmelberger S., Andersson M., Hanifi D., Xia Y., Zhang S., Wang J., Hou J., Salleo A., Inganäs O., “The Effect of Processing Additives on Energetic Disorder in Highly Efficient Organic Photovoltaics: A Case Study on PBDTTT-C-T: PC71BM”, *Advanced Materials*, Vol. 27, (2015), pp 3868-3873.