Physical sciences/Optics and photonics/Applied optics/Solar energy and photovoltaic technology [URI 639/624/1075/524]

Reply to "Tandem organic solar cells revisited"

Timmreck et al reply -- In our recent correspondence [1], we presented a set of general rules for characterizing tandem organic solar cells to achieve reliable and comparable device performance data, especially cell efficiencies.

In a comment on our correspondence, Bahro et al. present a useful supplement to our analysis [2]. They provide external quantum efficiency (EQE) data for an organic tandem solar cell without bias illumination, showing a case where the cell's EQE does not follow the lower envelope of the EQE spectra of the two subcells due to the specific intensity of the probe light. We agree that this can be a practically relevant issue and thank Bahro et al. for highlighting it.

Furthermore, Bahro et al. comment on rule 3 of our general rules for characterizing tandem organic solar cells [1]. They point out that when the EQE of a tandem cell without bias illumination is not following the lower envelope of the sub-cells' EQEs, measurements under bias light can deliver a correct result in certain cases. Actually, we feel we have already covered this circumstance, albeit not highlighted specifically, in our supplementary information in the last paragraph of section 3.1. However, for the purposes of simplicity and transparency, we suggest to keep rule 3 unchanged as is. Our supplementary information combined with the comment of Bahro et al. make the correct characterization procedures clear.

[1] *Nature Photonics*, **9(8)**, 478–479 (2015)

[2] Bahro et al. Comment on Nature Photonics, 9(8), 478–479 (2015)

Ronny Timmreck, Toni Meyer, Jan Gilot, Holger Seifert, Toni Mueller, Alice Furlan, Martijn M. Wienk, David Wynands, Jochen Hohl-Ebinger,Wilhelm Warta, René A. J. Janssen, Moritz Riede & Karl Leo

Author Affiliations

Ronny Timmreck, Toni Meyer, David Wynands, Moritz Riede & Karl Leo

Institut für Angewandte Photophysik, Technische Universität Dresden (TUD), 01062 Dresden, Germany

Jan Gilot

Holst Centre, High Tech Campus 31, 5656 AE, Eindhoven, Netherlands

Holger Seifert, Jochen Hohl-Ebinger & Wilhelm Warta

Fraunhofer Institute for Solar Energy Systems (ISE), Heidenhofstr. 2, 79110 Freiburg, Germany

Toni Mueller

Heliatek GmbH, Treidlerstr. 3, 01139 Dresden, Germany

Alice Furlan, Martijn M. Wienk & René A. J. Janssen

Molecular Materials and Nanosystems, Eindhoven University of Technology (TUe), 5600 MB Eindhoven, Netherlands

David Wynands

Fraunhofer COMEDD, Maria-Reiche-Straße 2, 01109 Dresden, Germany

Moritz Riede

Clarendon Laboratory, Physics Department, University of Oxford, Parks Road, Oxford OX1 3PU, UK