

**AKE 9: Erneuerbare Energie 4 - Photovoltaik**

Time: Tuesday 11:00–12:00

Location: DO24 Reuter Saal

**Invited Talk** AKE 9.1 Tue 11:00 DO24 Reuter Saal  
**The Success of Photovoltaics: A Pure Silicon Story** — •JÜRGEN H. WERNER — Institut für Photovoltaik, Universität Stuttgart

Within the last 38 years, photovoltaics went through a dramatic development: On the one hand, the price of modules and photovoltaic electricity dropped to less than 1/100 with respect to 1976. On the other hand, this drastic price reduction has solely been caused by one cell material: crystalline silicon. As a consequence, photovoltaic industry (and research) is almost in a lock-in situation: hardly any other technology is able anymore to commercially compete with the 15 to 18 % efficient standard industrial modules, containing 16 to 20 % efficient cells. Future progress probably will not be driven by research on new materials and/or new cell concepts. Instead, the success of crystalline silicon in lowering cost of photovoltaic electricity (8 cents/kWh at present in Germany) imposes other research challenges: i) Simple, low cost - but high tech - mass production technologies for silicon modules (cells) with more than 20 % (22 %) efficiency, ii) storage of photovoltaic electricity (which might also be silicon driven), iii) electrical and optical characterization methods for running large and small area photovoltaic systems, iv) intelligent photovoltaic systems, which interact with their environment.

**Invited Talk** AKE 9.2 Tue 11:30 DO24 Reuter Saal  
**Organic photovoltaics: With tailored materials on the move**

**to future technology** — •PETER BÄUERLE — Universitaet Ulm, Institut fuer Organische Chemie II und Neue Materialien

The lecture will give an introduction to organic photovoltaics (OPV) and discuss the state-of-the-art of this future technology. The progress and the problems in the development of novel organic semiconducting materials based on small molecules, and in particular oligothiophenes will be described.[1]

Very recently, we could increase the efficiency in vacuum-processed small molecule organic solar cells to (record) values of 6.9-7.7% for single junction cells[2] and (world record) values of 12.0% for multi-stack cells.[3] The technology of light-weight, flexible, and semi-transparent organic solarfoils is starting to be commercialized and first applications in building and car integration will appear on the market soon.[4]

[1]A. Mishra, P. Bäuerle, *Angew. Chem. Int. Ed.* 2012, 51, 2020-2067.

[2]R. Fitzner, E. Mena-Osteritz, A. Mishra, G. Schulz, E. Reinold, M. Weil, C. Körner, H. Ziehlke, C. Elschner, K. Leo, M. Riede, M. Pfeiffer, C. Uhrich, P. Bäuerle, *J. Am. Chem. Soc.*, 2012, 134, 11064-11067.

[3]Press release on January 16th, 2013, Heliatek ([www.heliatek.com](http://www.heliatek.com)) and Ulm University (<http://www.uni-ulm.de/en/nawi/institute-of-organic-chemistry-ii-and-advanced-materials.html>)

[4][www.heliatek.com](http://www.heliatek.com)