

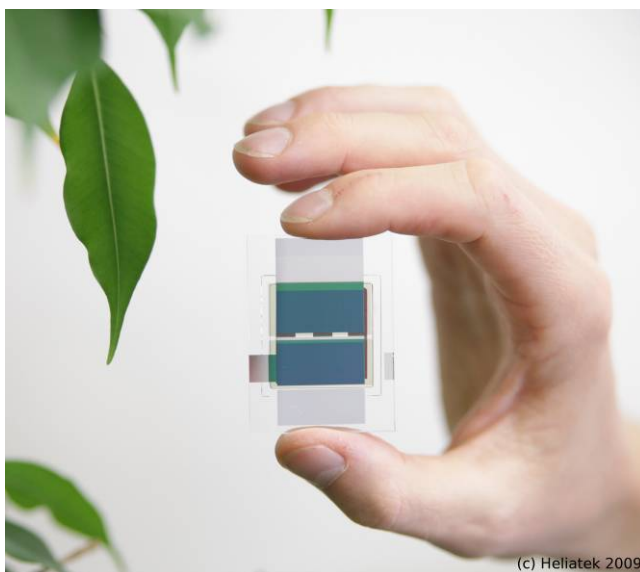
PRESS RELEASE

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Organic pin-type Tandem Solar Cells by Heliatek, IAPP and BASF reaches efficiency record

In a joint R&D-project with the IAPP (Technische Universität Dresden, Germany) and BASF SE, Heliatek has achieved an outstanding record value for organic solar cells based on vacuum deposited small molecules: a power conversion efficiency of 5.9% for an active area of 2 cm² has been confirmed by the National Renewable Energy Laboratory (NREL). The highest previously confirmed value for organic solar cells with an active area exceeding 1cm² was 5.4% for a polymer-based device.

The tandem solar cell reaches an open circuit photovoltage of 1.6V and a fill factor of 65%. The width of the certified device corresponds to a typical stripe width for thin film PV modules with integrated series interconnection. The results therefore represent a major step towards a future mass production of small molecule based solar cells. The new technology enables the production of light-weight, and if required flexible, large-area solar cells at low costs and with little material and energy consumption. The required layer thicknesses are in the range of 100 nanometer (1/10000 mm). Thus only about 1 gram of organic semiconductor materials is required for 1 square meter of solar cell area. To establish a production process, synergies with the already well established technology for large area deposition of small molecule organic light emitting diode (OLED) displays can be used.



The record value was achieved with a tandem solar cell: in order to make optimum use of the light with different color included in the sun spectrum, two different dye pigments are combined. To harvest (absorb) blue and green light, an organic "oligomer" developed by Heliatek in cooperation with the University of Ulm is used, while yellow and red light is absorbed by a novel dye pigment synthesized by BASF. An oligomer is a polymer with short chain of well defined length. In contrast to polymers, oligomers can be thermally evaporated in vacuum

without decomposition due to their light weight thus enabling the deposition of ultrathin layers by a vacuum evaporation process. The novel solar cell is based on Heliatek's proprietary p-i-n tandem cell architecture. Here, the above mentioned coloured layers that harvest the sun light are embedded in a system of "p- and n-doped" layers where the

organic dopant molecules are provided by Novald AG, Dresden. The doping technology for organic semiconductors has been developed in the recent years at IAPP and its spin-off Novald. It is already successfully used in OLEDs.

The aim of Heliatek, BASF and Bosch within their joint development agreement is to further increase the device efficiency to 9-10% and to establish a first pilot production line by 2011. These activities are embedded into a major R&D project that also includes IAPP, Universität Ulm, Novald and Von Ardenne Anlagentechnik (VAAT) and receives funding from the Federal Ministry for Education and Research (BMBF). The cooperation between Heliatek and IAPP in which the certified devices were made is based on the BMBF-funded Innoprofile group "Organic p-i-n Devices" and its developed research and technology platform. Further funding is received from the state of Saxony via the Sächsische Aufbaubank (SAB) within a project focused on the optimization of the nanomorphology of photoactive layers in solar cells.

About Heliatek

Heliatek is a common spin-off company from the University of Technology Dresden and the University Ulm. It has closed its first major financing round in 2007 with BASF, BOSCH, Wellington and the High-Tech Gründerfonds as investors. The mission of Heliatek GmbH, Dresden, is to develop a mature technology of organic vacuum deposited solar cells and introduce it into the market. The technology development comprises tailored organic absorber materials, device integration and production processes.

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About IAPP

The Institut für Angewandte Photophysik (IAPP) of the Technische Universität Dresden is a leading research institute working on basic and applied research on organic semiconductors. In the past years, the institute has realized a number of innovations in organic devices. Furthermore, the institute has spun out several companies, including Novald AG, Heliatek GmbH, Creaphys GmbH, and sim4tec GmbH. The InnoProfile group "Organic p-i-n Devices" is a junior research group funded by the German Federal Ministry of Education and Research (BMBF) at the IAPP. Its goal is to establish a technology and development platform for organic devices and to further strengthen applied research on organic electronics in the region.

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