

## Media release

Duebendorf, St. Gallen, Thun, 21. September 2012

**VELUX FOUNDATION supports Empa research**

### **Solar hydrogen thanks to artificial photosynthesis**

**All over the world the concept of artificial photosynthesis –the conversion of solar energy into a chemical energy storage medium such as hydrogen – is currently a hot research topic. The process involves the use of solar cells as well as so-called photoelectrochemical cells. Empa is also carrying out research in this field and was recently awarded funding to the tune of CHF 230,000 from the VELUX Foundation.**

Technically speaking our exploitation of the sun's energy is primarily based on the direct conversion of sunlight into electrical power through the use of solar cells. Storing this electrical energy cheaply is, however, something of a challenge. On the other hand hydrogen is a very promising medium for storing energy chemically, and it can be generated directly from sunlight and water using photoelectrochemical cells. If at the same time the greenhouse gas carbon dioxide could be extracted from the air and bound into this chemical process, this would offer a means of manufacturing synthetic fuels.

Empa researchers Artur Braun and Julian Ihssen have been investigating low-priced raw materials which can be used to manufacture the electrodes in photoelectrochemical cells. One possible example is iron oxide in conjunction with an algae protein, a particularly efficient "energy collector" in natural daylight. Empa's Biomaterials Laboratory in St. Gallen and its High-Performance Ceramics Laboratory in Duebendorf have recently begun a collaborative research project on the development of bio-functionalized iron oxide electrodes for hydrogen production based on solar energy, with funding provided by the VELUX Foundation. "The financial support by the VELUX Foundation for our research work has brought new inspiration with it: solar energy converters and storage systems which can be integrated into building components such as windows, roofs and façade surfaces, all extremely interesting ideas!" in the words of Artur Braun of the institution's High-Performance Ceramics Laboratory.

The VELUX Foundation was established in 1980 and has its headquarters in Zürich. Its primary objective is to offer support for research work into all aspects of the effects of the sun's light and its efficient exploitation. This includes on the one hand the influence of daylight on human well-being and healing processes during physical and mental illnesses, as well as the effect of nature and modern technologies for the usage of daylight in buildings, for example for illumination and for improving energy efficiency. Since 2007 the

foundation has awarded its "Daylight Prize", the highest value bestowal in the architectural field in Switzerland. In addition, the VELUX Foundation encourages research into healthy aging and ophthalmology.

**Further information**

Dr. Artur Braun, Empa, High-Performance Ceramics Laboratory, Tel. +41 58 765 48 50, [artur.braun@empa.ch](mailto:artur.braun@empa.ch)

Dr. Julian Ihssen, Empa, Biomaterials, Tel. +41 58 765 77 98, [julian.ihssen@empa.ch](mailto:julian.ihssen@empa.ch)

[www.veluxstiftung.ch](http://www.veluxstiftung.ch)

**Editor / media contact**

Dr. Michael Hagmann, Communication, Tel. +41 58 765 45 92, [redaktion@empa.ch](mailto:redaktion@empa.ch)