Organic and bio-organic systems for solar energy conversion and CO2 Recycling

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Abstract

Organic photovoltaic cells are maturing from the academic research into the industrial development, entering the markets. Pure organic nanostructures and organic/inorganic hybrid nanostructures are comparatively studied for such devices. This talk gives an overview of materials' aspect and devices.

In order to account for a sustainable future, the application of biodegradable and biocompatible systems for organic optoelectronics are needed. The use of cheap electronic devices in a large scale will introduce a "consumable electronics" into the market of "consumer electronics". Therefore environmentally friendly materials are important to use. This is a next great challenge to material science in organic electronics. New developments of bio-inspired and/or bio-origin, bio-compatible materials from our institute will be reported. Such materials can also be used to interface the biological and biomedical research with the organic electronics field.

Last but not least the conversion of CO2 to methane (or other synthetic fuels) using solar energy is an important step to make an efficient, large scale energy storage. At the same time this will make a cyclic and sustainable CO2 economy. We report organic as well as bio-organic catalysts which can be used in photo-electro-catalytic conversion devices. Such bio-catalysts can be enzymes as well as living bacteria immobilized on electrodes. Selectivity of such bio-catalysts is very high and combined with the room temperature operation of such bio-electro-catalytic systems makes them industrially highly attractive.

Biography

Prof. Sariciftci is Ordinarius Professor for Physical Chemistry and the Founding Director (Vorstand) of the Linz Institute for Organic Solarcells (LIOS) at the Johannes Kepler University of Linz/Austria.

His major contributions are in the fields of photoinduced optical, magnetic resonance and transport phenomena in semiconducting and metallic polymers. He is the inventor of conjugated polymer and fullerene based "bulk heterojunction" solar cells.