

Organic Electronic Materials: Quo Vadis?

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Organic light emitting diodes (OLEDs), organic photovoltaic cells (OPVs) and organic field effect transistors (OFETs) are maturing from the academic research into the application type of industrial development. The different photoinduced energy and electron transfer mechanisms of solar energy harvesting as well as conversion are investigated and understood to a relatively high level. Pure organic nanostructures and organic/inorganic hybrid nanostructures are comparatively studied for devices. This talk gives an overview of materials' aspect, charge-carrier-transport, and device physics. Different new materials are entering the field with tailored and optimized properties. General trends such as low band gap materials are visible but new developments of bio-inspired and/or bio-origin, bio-compatible materials are interesting new developments. Such materials can be used to interface the biological and biomedical research with the organic electronics field.

Furthermore, the use of solar photoenergy to reduce CO₂ into hydrocarbon based synthetic fuels is discussed. Such artificial photosynthesis type chemical fuel production can simultaneously solve the large scale energy storage and energy transport problems of renewable energies. New materials are needed in this direction with photo-(electro) catalytic properties.