

International Conference and Exhibition on

Materials Chemistry

March 31-April 01, 2016 Valencia, Spain



Michael W Tausch

University of Wuppertal, Germany

Photocatalytic redox reactions

For investigating successfully, the mechanisms and techniques of light conversion into other energies, including energy storage in high energetic chemical compounds; we have to learn from nature. Doing so, we realize that effective biological systems like those in green leaves and in human eyes are in fact photoactive nano machines. That's, why I say "Photo & Nano is a successful couple in using solar radiation on this planet". So we have to search for artificial nano systems able to do act as photocatalysts. A model experiment called Photo-Blue-Bottle PBB simulating the natural cycle of photosynthesis and respiration has been developed and will be presented in this talk. It is practicable in homogeneous as well as in heterogeneous systems. There are following similarities between the reaction cycles in the PBB experiment and the natural cycles of photosynthesis and respiration: i) The carbon cycle in natural photosynthesis and respiration is similar to the substrate (ethylviologene) cycle in the PBB experiment, ii) the photocatalyst (proflavine or titanium dioxide) in the experiment works in principle similar like chlorophylls and other pigments in green leaves, iii) the photocatalytic active species must absorb the available light, i.v.) all reactions occur in aqueous solution, v) the oxidizing agent is oxygen from air in both cases, vi) the reduction needs light as driving force and vii) in the PBB experiment as well as in the natural photosynthesis light is converted into chemical energy and stored in the reduced substrate. The different versions of the PBB experiment suitable for investigating i) – vii) will be carried out at this conference in the workshop "Conversion of Light into Chemical Energy".

Biography

Michael W Tausch studied chemistry at the Polytechnic Institute of Bucharest, Romania, from 1967 to 1972. He subsequently studied mathematics and educational sciences in Bremen and Oldenburg, both Germany, and received his PhD from the University of Bremen in 1981. He was a teacher for chemistry and mathematics from 1976–1996. In 1996, he completed his habilitation at the University of Duisburg-Essen, Germany and became Professor for Chemistry and Chemical Education there. In 2005, he moved to the Department for Chemistry Didactics at Bergische Universität Wuppertal, Germany. He has published more than 222 papers and textbooks.

mtausch@uni-wuppertal.de

Notes: