

International Conference and Exhibition on

Materials Chemistry

March 31-April 01, 2016 Valencia, Spain

Photoprocesses in science education

Michael W Tausch

University of Wuppertal, Germany

A fundamental demand on science education today is to communicate core principles of chemistry, physics, biology and informatics in close combination with everyday life experiences of students as well as with convincing applications from modern science and technology. Photochemical and photophysical processes are par excellence suitable to fulfill this requirement. Therefore research in science education is challenged to develop experiments, concepts and teaching materials which help to interpret and communicate photoprocesses in a manner, that it is both, exciting and understandable. Adequate teaching concepts, experiments and materials have bridge the gap between the state of the art in science and technology and the everyday educational activities in high schools, colleges and universities. Starting from N. J. Turro's paradigm of the excited states of molecules as "*the heart of all photoprocesses*" and their interpretation as "*an electronic isomer of the ground state*", a set of variations of this big idea, related models and further teaching materials have been developed in order to introduce and investigate different types of photoprocesses without and with chemical transformation. In this lecture a series of experiments leading to the concepts of photo-, chemo- and electroluminescence, energy and electron transfer, photoisomerization and photosteady will be presented and discussed together with actual applications of these phenomena. Using selected classes of photoprocesses, a gradual theoretical approach based on experimental observations will be proposed. As an example the fluorescence will be exemplified and discussed from the simple case of a luminescent dye in solution until the luminescence depletion or amplification in aggregated systems.

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: