

## Charge transfer in fullerene-chromophor systems studied with light-induced electron spin resonance

D. Wróbel<sup>1</sup>, A. Graja<sup>2</sup>, K. Lewandowska<sup>1</sup>, and H. Manikowski<sup>1</sup>

<sup>1</sup>*Faculty of Technical Physics, Institute of Physics, Poznan University of Technology, ul. Nieszawska 13A, 60-965 Poznań, Poland*

<sup>2</sup>*Institute of Molecular Physics, Polish Academy of Sciences, ul. M. Smoluchowskiego 17, 60-179 Poznań, Poland*

The process of photoinduced electron transfer plays an essential role both in sciences and life. For that reason great attention has been devoted towards preparation of donor-acceptor linked molecular systems to design and construct of molecular solar energy converters, to create efficient photoinduced electron-transfer in optoelectronic devices and to follow electron transfer processes e.g. in models of photosynthesis and processes of vision [1].

New experimental equipments and advanced organic chemistry technologies give very wide possibilities to study classes of the electron-donating and electron-withdrawing systems in which an electron is transferred producing the radical cation of the donor and/or the radical anion of the acceptor, upon photoexciting one of these species.

Among the wide variety of donor-acceptor systems suitable for displaying photoinduced electron transfer processes are systems in which fullerene (C<sub>60</sub>) molecules are covalently linked to a chromophore. In this paper following systems were investigated: fullerene covalently linked with porphyrins (P-C<sub>60</sub>) and perylenediimide (PDI-C<sub>60</sub>); porphyrin, porphyrin dyads and perylenediimide were used as standard samples. Photoinduced electron transfer in the fullerene-chromophor dyads was investigated with light induced electron spin resonance (LESR) spectroscopy. The LESR signals of the samples in CHCl<sub>3</sub> solutions were recorded in the dark and under light illumination, at room temperature and at about 80K. It was stated that the LESR signal increases stepwise with the incident light and decreases slowly when the light is switched-off. The photogeneration of cationic ion-radicals of chromophores when linked to fullerene and of C<sub>60</sub><sup>•-</sup> ion-radical were observed and analyzed. The principal parameters of the LESR lines of the ion-radicals are determined.

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[1] V. Balzani (Ed.), *Electron Transfer in Chemistry* 1-5, Wiley-VCH, Weinheim, 2001.