The Global COE Program "Center for Electronic Devices Innovation"

Global Seminar: " Recent Development of Organic Devices and Materials (IV)"

July 23, 2009

Room: Library Hall, Osaka University Science and Engineering Librar http://suita.library.osaka-u.ac.jp/intro_access.html#map (理工学図書館 3F 図書館ホール) *入館に際し、学内関係者は図書館利用者票、学生証が 必要となりますので、ご注意下さい 学外の方は、受付カウンターにてセミナー参加である旨 お伝え頂ければ、入館していただけます

Sponsored by the Global COE Program "Center for Electronic Devices Innovation" Co-sponsored by :大阪大学有機エレクトロニクス研究会

Meeting Program <15:30-17:00> Invited oral presentation

<15:30-16:30>

Organic Nanostructures for Optoelectronic Devices Prof. Niyazi Serdar Sariciftci (Johannes Kepler University, Austria)

<16:30-17:00> Discussion



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Organic Nanostructures for Optoelectronic Devices

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Abstract

Recent developments on conjugated polymer based photovoltaic diodes and photoactive organic field effect transistors are discussed. The photophysics of such devices is based on the photoinduced charge transfer from donor type semiconducting conjugated polymers onto acceptor type conjugated polymers or acceptor molecules such as Buckminsterfullerene, C_{60} . Potentially interesting applications include sensitization of the photoconductivity and photovoltaic phenomena as well as photoresponsive organic field effect transistors. In addition, organic/inorganic nanoparticle based "hybrid" solar cells will be discussed. This talk gives an overview of materials' aspect, charge-transport, and device physics of organic diodes and field-effect transistors.

Furthermore, due to the compatibility of carbon/hydrogen based organic semiconductors with organic biomolecules and living cells there can be a great opportunity to integrate such organic semiconductor devices with the bio-medicine.

Last section will be dedicated to organic synthetic fuel production techniques using solar energy. Such chemical energy storage methods will solve the "transport/storage problems" of renewable energies.

1)"Photoinduced Electron Transfer from a Conducting Polymer to Buckminsterfullerene"

N. S. Sariciftci, L. Smilowitz, A. J. Heeger and F. Wudl, Science Vol. 258, 1474 (1992).

2) "Semiconducting Polymer - Buckminsterfullerene Heterojunctions: Diodes,

Photovoltaic Cells", N. S. Sariciftci, D. Braun, C. Zhang, V. Srdanov, A. J. Heeger and F. Wudl, *Appl. Phys. Lett.* Vol. 62 (6), 585 (1993).

3) "Plastic Solar Cells"

Christoph J. Brabec, N. Serdar Sariciftci, Jan Kees Hummelen, *Advanced Functional Materials*, Vol. 11 No: 1, pp.15-26 (2001)

4) "Bio-Organic Semiconductor Field Effect Transistors based on DNA Gate Dielectric"

Th. B. Singh, N. S. Sariciftci, J. Grote, F. Hopkins, Journal of Applied Physics, Vol 100, 24514 (2006).

5) "Organic Photovoltaics Concepts and Realization", edited by C. Brabec, V. Dyakonov, J. Parist and N-S. Sariciftci (eds.), Springer-Verlag, Germany, 2003.

6) "Organic Photovoltaics", edited by S.-S. Sun and N.S. Sariciftci, Taylor & Francis, Florida, USA, 2005.
7) "Progress in Plastic Electronics Devices", B. Singh, N.S. Sariciftci

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