

演題: "Hybrid Nanoelectronics"

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日時: 2011 年 10 月 20 日 (木) 16:00~17:00

場所: 工学部材料化学棟 MC102

has been changed to MC208



In this talk, we shall describe efforts made at our labs in BARC to fabricate hybrid electronic components, such as, dielectric, rectifier, resonant tunnel diode, transistor and memory, using self-assembled mono/multilayers of organic semiconductors on Si. In particular, we shall underline the emphasis of our studies on the following important aspects: (i) to look for short alkyl chains consisting of σ bonds alone to fabricate a self-assembled monolayer (SAM) which acts as a dielectric layer with reduced thickness; (ii) to design new organic molecules for growing electroactive semiconducting layers, viz. porphyrin-based σ - π molecules which show memory effect and diode action; or, diazo-based σ - π - σ molecules (DHTT), monolayers of which exhibit negative differential resistance (NDR); (iii) to adopt new strategies to anchor organic conducting molecules on Si, such as electrografting; or electrografting alongwith self-assembly, as in the case of donor-acceptor bilayers consisting of fullerene (C_{60}) and tetraphenyl porphyrin derivative (TFPP), which act as diodes; and (iv) to employ different growth methods, as suitable, for high quality organic semiconductor films, viz. organic-MBE to grow high mobility thin films of CoPc; air-water interface to grow free-standing polypyrrole nanosheets; or films of donor-acceptor (EDT-TTF) derivatives; LbL growth; or use of a SAM-modified Si-substrates for self-organization of conducting layers.

Primary concern in this subject is to investigate the role played by the interface between the gate electrode and Si-substrate, or that between the dielectric layer and the active organic semiconductor layer, which will be discussed.

1. 本講演会および Prof. Yakhmi による 4 回の講義に全参加し(集中講義・別紙参照)、レポートを提出すると「先端総合化学特論 II (Modern Trends in Chemical Sciences and Engineering II)」の 1 単位が認定されます。

2. 上記とは別に、本講演会は「化学研究先端講義 (Topical Lectures in Chemical Sciences & Engineering) / 総合化学特別研究第二(Research in Chemical Sciences & Engineering II)」の一部として認定されています。

3. 出席回数は上記 1.2.どちらかの科目でのみのカウントとなります。

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