ΙΤΕ/ΙΕΧΜΗ

ΣΕΜΙΝΑΡΙΟ

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ΟΜΙΛΗΤΗΣ: **Στυλιανός Νεοφυτίδης,** Διευθυντής Ερευνών
Ινστιτούτο Επιστημών Χημικής Μηχανικής (ΙΕΧΜΗ)
Ίδρυμα Τεχνολογίας και Έρευνας (ΙΤΕ)

ΘΕΜΑ: **The role of electrocatalysis on the successful implementation of sustainable energy technologies**

ΤΟΠΟΣ: Αίθουσα Σεμιναρίων ΙΤΕ/ΙΕΧΜΗ

ΗΜΕΡΟΜΗΝΙΑ: **Δευτέρα, 11 Μαΐου 2015**

ΩΡΑ: **12:30**

ΠΕΡΙΛΗΨΗ

Electrocatalysis is on the edge of the core sciences that support the development and the establishment of environmentally friendly and sustainable electrochemical energy technologies. These are based on fuel cells and the renewable electrochemical H_2 production to be used as fuel for the fuel cell in a hydrogen based economy. The activities of the Laboratory of Electrochemical Processes (LEP) at FORTH-ICE/HT are mainly focused on the development of the materials that constitute the structure of the electrochemical interfaces and the study of the structural effects, the charge transfer and reaction processes that take place on these interfaces.

The main activities of LEP will be briefly deployed focusing on the roadmap from the basic scientific investigation to the technology production. In this respect the following subjects will be described:

1. Solid Oxide Fuel Cells (SOFCs). The development of carbon tolerant Ni based anodic electrodes for SOFCs. In the case of SOFC technology natural gas or hydrocarbons can be transformed catalytically in the anodic compartment into H_2 through the steam reforming reaction, which is readily oxidized electrochemically at the anode to produce electricity.

The aim is to operate under low Steam/Carbon so as to avoid the oxidation of the electrode by H_2O, while inhibiting the carbon deposits. This has been achieved by doping Ni with small quantities of Mo and Au.

2. High Temperature PEM fuel cells (HTPEM). The structure and stability of the electrochemical interface that is formed between the catalytic layer and the phosphoric acid (PA) imbibed polymer electrolyte of a HTPEM fuel cell depends on the uniform distribution of (PA) within the catalytic layer. A new catalyst support based on pyridine functionalized carbon nanotubes has been developed in order to be able to control the hydrophobic/hydrophilic nature of the catalytic layer and the efficient operation of the fuel cell under high steam and CO contents in the H_2 reformate feed, originating from the reforming of hydrocarbons.

3. Photoelectrocatalysis. Photoelectrocatalytic H_2 production either by water splitting or photoelectroreforming of organics are promising for renewable H_2 production either by using cheap photoelectrocatalysts based either on TiO_2 or ZnO or raw materials as urban waste organics. The electrochemical activation of TiO_2 will be discussed briefly resulting in a sixfold increase of its photoelectrocatalytic activity.

ΣΥΝΤΟΜΟ ΒΙΟΓΡΑΦΙΚΟ

Περισσότερες πληροφορίες για το βιογραφικό του κ. Νεοφυτίδη μπορείτε να βρείτε στο URL http://www.iceht.forth.gr/staff/neophytides.html .