



ΙΤΕ/ΕΙΧΗΜΥΘ

ΠΡΟΣΚΕΚΛΗΜΕΝΗ ΟΜΙΛΙΑ ΠΡΟΣΚΕΚΛΗΜΕΝΗ ΟΜΙΛΙΑ

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ΘΕΜΑ: **Heterogeneous molecular catalysis: bridging nature's wisdom to R&T.**

ΤΟΠΟΣ: Αίθουσα Σεμιναρίων ΙΤΕ/ΕΙΧΗΜΥΘ

ΗΜΕΡΟΜΗΝΙΑ: Τετάρτη, 23 Νοεμβρίου 2011

ΩΡΑ: 12:00

ΠΕΡΙΛΗΨΗ:

Natural catalytic enzymes are performing a multitude of catalytic reactions with high-yield, Turnover Numbers, selectivity, rapid kinetics etc. while they can sustain extreme physicochemical conditions [pH, Redox potentials, reactive radical intermediates, photo-stress, oxidative stress]. Mimicking natural catalytic systems by “artificial enzymes” is a challenging and promising R&T approach. This requires a interdisciplinary approach e.g. synthetic chemistry, materials science and engineering and physicochemical techniques and methods.

Herein we will present novel **Functionalized Heterogeneous Catalytic Materials** and their applications in **Environmental** and **Industrial Catalysis**. The catalysts' architecture contains an “active metal complex” [which mimics the catalytic active-site of enzymes] plus an inorganic materials' matrix whose porosity/hydrophobicity/surface charger are manipulated to mimic the protein matrix in enzymes.

[i] Molecular catalysts based on Iron [heme or non-heme]: these systems can sustain extreme redox potentials therefore are unique in Environmental catalysis of persistent pollutants such as Halogenated Phenols and Pesticides.

[ii] Molecular catalysts based on Cu or Mn: these systems can be activated by O₂ or H₂O₂ therefore are ideally suitable for hydrocarbon oxidations.

Spectroscopic Techniques such as Electron Paramagnetic Resonance [EPR] are eminently suited for monitoring in situ the evolution of the catalytic intermediates.