



ΕΘΝΙΚΟ ΜΕΤΣΟΒΙΟ ΠΟΛΥΤΕΧΝΕΙΟ
ΣΧΟΛΗ ΧΗΜΙΚΩΝ ΜΗΧΑΝΙΚΩΝ

ΕΠΙΤΡΟΠΗ ΣΕΜΙΝΑΡΙΩΝ, Καθηγητής Α. Κοκόσης

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ΣΕΜΙΝΑΡΙΟ ΧΗΜΙΚΗΣ ΜΗΧΑΝΙΚΗΣ

Πέμπτη 14 Απριλίου 2011, 14:00
Αίθουσα Σεμιναρίων «Ν. Κουμούτσου»

Dr. William J. Koros

Georgia Institute of Technology, Atlanta

**An Evolutionary Path to a Revolution in Separation
and Purification Processes to Enable Global
Sustainability**

Although purification and separation processes provide products vital to society, most large scale approaches still rely primarily upon highly energy intensive operations such as distillation and consume a significant fraction of global energy. To satisfy the diverse separation and purification needs of society with a lower carbon footprint, evolution beyond traditional approaches must occur. In principle, the energy intensity and carbon dioxide emissions associated with many large scale separations can be reduced by a full order of magnitude by substituting membrane processes for traditional thermally-driven separation approaches. To enable such substitutions, however, new generations of economical materials and devices are needed. A broad spectrum of nanostructured materials ranging from pure inorganics, metals and carbons to pure organic polymers can enable this approach. Moreover, hybrid materials containing molecularly selective nanoscopic dispersed phases in a polymer continuous phase are important components in this vision. Identifying and motivating practical approaches to create such revolutionary devices begins with chemical engineers but must also integrate diverse contributions from materials scientists and mechanical engineers with a systems perspective. This presentation will consider an evolutionary path to reach revolutionary next generation membranes. These membranes are suitable for large scale separation processes with much lower energy intensity and carbon footprints that are compatible with global sustainability.