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Κύριος Ερευνητής ΙΤΕ/ΕΙΧΗΜΥΘ

ΘΕΜΑ: **Βασική μελέτη νανοσύνθετων υλικών για βιομηχανικές εφαρμογές**
Fundamental Studies of Nanocomposite Materials for Industrial Applications

ΤΟΠΟΣ: Αίθουσα Σεμιναρίων ΙΤΕ/ΕΙΧΗΜΥΘ

ΗΜΕΡΟΜΗΝΙΑ: Τρίτη, 23 Μαρτίου 2004

ΩΡΑ: 17:00

ΠΕΡΙΛΗΨΗ

This presentation will concentrate on two technological categories where the fabrication of nanocomposite structures as well as the control of their morphology creates significant advantages in their properties and performance. The first technological category is the use of semiconducting polymers as active materials in a number of electronic applications, such as light emitting diodes (LEDs), photovoltaic cells and field effect transistors (FETs). In particular to photovoltaics, improved performance has been obtained from devices comprised of nanophase separated bulk heterojunction blends due to efficient charge photogeneration and separation. The control of morphology in these nanostructures is the key that governs the photovoltaic performance of the final devices. Main chain conjugated polymers such polyether containing anthracene units (**PAN**), poly[2-methoxy-5-(2-ethylhexyloxy)-1,4-phenylenevinylene] (**MEH-PPV**) and regioregular poly(3-hexylthiophene-2,5-diyl) (**P3HT**) have been characterized in order to be used such optoelectronic devices. In addition, blends of these polymers with electron transporting materials such as poly[2-(4-mathacryloxyphenyl)-5-phenyl)-1,3,4-oxadiazole (**POXD**), alkoxy-substituted terphenyl polyether containing oxadiazole units (**PTPOXD**) and poly(vinyl-diphenylquinoline) (**PVQ**) to name some have been also prepared and studied.
The second part of the talk will focus on the use of nanocomposite structure reinforcements, instead of the more traditional particulate-filled microcomposites, in an effort to enhance the properties of various polymeric materials and to also extend their utility. The presence of nanoclay in these structures can lead to dramatic improvements in a variety of properties. The clay can also be modified by using silane coupling agents. As a result, due to effective dispersion and excellent interfacial coupling, it is possible to convert bulk polymers into interfacial polymers with a variety of new properties, such as improved toughness/stiffness/strength balance, higher crystallinity and lower permeability in gasses.