



ΣΕΜΙΝΑΡΙΟ

ΙΤΕ/ΕΙΧΗΜΥΘ

ΟΜΙΑΗΤΗΣ: Prof. J.H.Wendorff
Institute of Physical Chemistry
Philipps University
Marburg
Germany

ΘΕΜΑ: “Molecular Reinforcement”

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ΤΟΠΟΣ : Αίθουσα Σεμιναρίων ΕΙΧΗΜΥΘ

ΩΡΑ: 19:00

ABSTRACT:

The replacement of macroscopic reinforcing fibers by rigid rodlike chain molecules i.e. by molecular fibers, offers a set of advantages such as the absence of defects on the surface of the fiber, a strong decrease of the tendency towards rupture during processing, high stiffness and strength and a good coupling to the matrix. Theoretical investigations show that molecular fibers have at least the same reinforcement effects as macroscopic fibers. Yet such theoretical investigations show, however, that the miscibility of rigid molecules with flexible matrix chain molecules is very low. We have shown on the basis of lattice calculations that rigid cross-like and rigid star-like molecules (rigid multipodes) composed of a rigid central group and rigid arms are characterized by a high solubility.

In addition they are predicted to cause a three-dimensional reinforcement effect. We have synthesized such multipodes based on the computer simulations and we have characterized their miscibility as well as their reinforcement effect experimentally. The experiments show that the concept works extremely well. In a last step we have developed means of producing such multipodes in situ during processing.