הטכניון – מכון טכנולוגי לישראל **הפקולטה להנדסת מכונות**

סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ד' 1.06.16 (כד' באייר, תשע"ו), בבניין דן-קאהן, קומה 0, אודיטוריום 1, 13:30.

יצה: עמרי וייס

מנחה: פרופ' איל זוסמן

על הנושא:

Mechanical and Thermodynamic Properties of Electrospun Polystyrene Nanofibers

The seminar will be given in Hebrew

להלן תקציר ההרצאה:

The mechanical and thermodynamic properties of polymer nano-objects show a remarkably irregular pattern in comparison with their bulk-related properties. Experimental studies have been conducted that demonstrate the effect of size on the properties of nano-scale polymer objects such as sharp increase in elastic modulus, ultimate strength and toughness and shift in melting and glass transition temperatures. The physical mechanisms causing the size dependent behavior are not fully clear and commonly attributed to confinement of supramolecular structures. In this work nanofibers were electrospun from different molecular weight polystyrene solutions resulting with diameter ranging between 150-750 nm. The confinement of polymer chains on the fiber surfaces and its role for the elastic properties enhancement was studied. Experimental solutions covering a broad range of elastic responses and relaxation times were studied using a rheometer. Our results clearly indicate that the presence of entanglements is not required for the formation of uniform fibers. As-spun fibers were studied using DMA (Dynamic Mechanical Analysis) and DSC (Differential Scanning Calorimetry). Fibers demonstrate decrease in glass transition and a sharp increase in the elastic modulus when the fiber diameter drops below a diameter of 250 nm and the molecular weight drops below 230K g/mol. The ultimate strength was found to be independent of the fiber diameter. Altogether this talk will help to uncover some issues for predictive modelling of size dependent behavior.

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בברכה,

שרון'א אמיר שת

מרכז הסמינרים