



**Wolfson Department of Chemical Engineering Special Seminar
Hall #6, Wolfson Department of Chemical Engineering,
Wednesday February 27th at 1:30pm**

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Polymer adsorption on the surface of carbon nanotubes

Carbon nanotubes (CNTs) possess unique properties leading to many potential applications, such as composite materials. However, due to their strong tendency to agglomerate, the quality of their dispersion in the processing liquid holds a key role in controlling the desired distribution and functionality in the final composite. Physical adsorption of polymers on CNTs through specific interfacial interactions hinders their aggregation and improves the compatibility of CNTs with the polymer matrix, thus strengthening their interface. In this work, stable dispersions of multi-walled carbon nanotubes (MWCNTs) in N,N-dimethyl formamide (DMF) were achieved by physical modification of the MWCNT surface using several block copolymers, with various molecular weights and chemical structures. The dispersions were imaged by cryogenic transmission electron microscopy (cryo-TEM) for qualitative evaluation of the CNT distribution. Structural information on the MWCNT/copolymer hybrid was achieved by detailed small angle neutron scattering (SANS) measurements using contrast variation, with particular emphasis on the conformation and adsorption density of the copolymers on the MWCNT surface. The various contrasts were obtained by suitable mixing of natural and deuterated solvent molecules, thereby highlighting different parts of the structure. Similar dispersions with Graphene were also measured, in order to evaluate the influence of surface curvature on the adsorption properties.

Refreshments will be served at 13:15pm

