Université Libre de Bruxelles
Faculté des Sciences
Séminaire du **Laboratoire de Dynamique des Polymères et de la Matière Molle**

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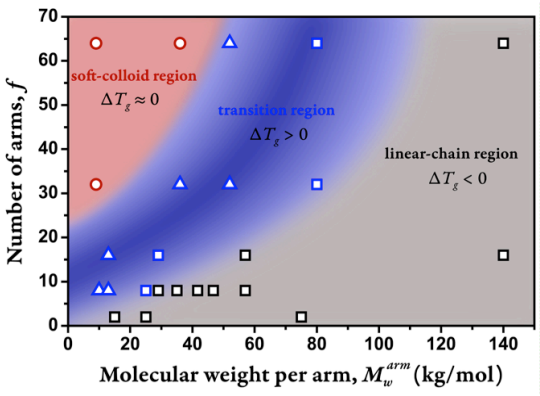
## Effect of Polymer Architecture on the Interfacial Properties of Polymers




Many physical properties of polymers, such as glass transition, wetting, structural relaxation, mechanical properties, dynamics, and crystallization are influenced by interactions between the macromolecules and external interfaces. In this talk I will discuss the role of macromolecular architecture, and in particular the star-shaped architecture, on the structure and dynamics of the polymers close to surfaces and interfaces. I will provide evidence that the behavior of polymer at the vicinity of an interface can be tailored not by changing the monomer or the interface chemistry, but simply by changing the macromolecular architecture and in particular through changes of the molecular characteristics (number of arms and arm length) of star-shaped polymers. In the first part of the talk I will show that star-shaped polystyrene (SPS) molecules exhibit notably different wetting properties than their linear analogues (linear polystyrene, LPS) [1, 2]. In particularly the equilibrium contact angles of macroscopic droplets of SPS, on oxidized silicon substrates, may be as much as one order of magnitude smaller than that of LPS droplets on the same substrates. Unlike linear chains, the wetting of SPS macromolecules is determined by the competition between their enhanced adsorption onto surfaces with increasing functionality (number of arms, f), and an opposing soft steric entopic repulsion with increasing f that limits their ability to adsorbed and closely "pack" onto surfaces. In the second part of the talk, I will show how the aforementioned competing effects in the interfacial properties of SPS are manifested on the vitrification behavior of SPS supported films [3, 4]. Experiments do show evidence of ordered organization of the molecules in the form of layers, in a manner identical to soft colloid particles. These results will be summarized in terms of a "Diagram of States" (Figure).

[1] E. Glynos, B. Frieberg, P.F. Green;. Physical Review Letters. 2011, 107, 118303 [2] E. Glynos, A. Chremos, B. Frieberg, G. Sakellariou, P.F. Green; Macromolecules, 2014, 47, 1137 [3] E. Glynos, et al.;. Physical Review Letters, 2011, 106, 128301 [4] E. Glynos, et al, Macromolecules, 2015, 48, 2305

le mercredi 3 juin 2015 à 16:00 h
Campus Plaine, Bat. NO, Salle Solvay

Pour plus d'informations veuillez contacter le Prof. Simone Napolitano (57 41)