BIOLOGICALLY ACTIVE AND RESPONSIVE INTERFACES VIA SURFACE-INITIATED POLYMERIZATION

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ABSTRACT

Thin polymer coatings are of great importance to control the interactions of synthetic materials with other materials (lubrication, wear), the environment (corrosion) as well as biology (marine antifouling). Modern polymer science offers unprecedented opportunities to chemically engineer the properties of surfaces and interfaces. This presentation will discuss three aspects. The first part of the presentation will introduce modern controlled/"living" radical polymerization techniques and "polymer brushes" (chain-end tethered monomolecular assemblies of densely grafted polymer chains) and present the scope and possibilities of these approaches to chemically modify surfaces and interfaces. The second part of the presentation will address the need for accurate surface chemical characterization and the challenges related to the precise determination of the localization and distribution of functional groups in thin polymer films. The presentation will end with several brief showcases that illustrate the use of modern polymer science tools to develop ultrathin polymer films that possess sensory properties, which can be used to control fluid flow, to template the controlled growth of metallic or non-metallic inorganic films on complex, 3D structured substrates as well as to guide and control cell adhesion.

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