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Interfacial Effects of Nanometer Fluorinated Segments on Energy Controlled Responsive Polymeric Films DVORA PERAHIA, ALMA GONZALES, DENNIS W. SMITH JR., Chemsitry Department Clemson University, Clemson SC 29634-0973 — Responsive polymeric thin films with controlled surface energy, dielectric constant and structure are critical for a variety of immerging technologies such as microfluidics, nano-electro-optical devices and nano-biotechnology. Introducing nanometer scale fluorinated segments into polymers offers a means to control surface energies and dielectric constants while enhancing significantly the chemical and thermal stability of materials. Fluorinated and protonated segments are highly incompatible and differ in their interfacial affinities. Introducing nanometer scale fluorinated segments offers a mechanism for the polymer to rearrange and respond to changes in the environment while retaining the integrity of the layers. The interfacial energies couples with structure were studies as a function of temperature for PFCB *(perfluoro cynclobutadiene)* based co-polymers. The structure varies from amorphous to liquid crystalline to crystalline with very small variations in comparison to protonated co-polymers. The polymer-air interface is found to be fluorine rich, however interfacial energy is found to be a complex function of the amount of fluorine and the conformation of the fluorinated segments at the interface.

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