

Abstract Submitted  
for the MAR09 Meeting of  
The American Physical Society

**Nano-adsorbents control surface properties of polyurethane** SUP-ING LYU, DARREL UNTEREKER, JIM SCHLEY, TOM GRAILER, ANNA BELU, CHRIS HOBOT, TERRI BARTLETT, RANDY SPARER — Additives are minor but critical components that polymers need for processing and applications. However, these additives may also have adverse effects, e.g. for polymeric biomaterials, leaching additives can change surface properties, and may lead to poor biocompatibility. How to use additives yet keep them from detrimental behaviors is challenging. Diffusion barriers may be used to slow down the additive migration but it is difficult to stop it. In this paper, we introduced the concept of “nano-adsorbents” in polymers. These nano-adsorbents confined the additives within the polymers via thermodynamically interacting with them. While the additives are still present in polymers to provide intended functions, they are thermodynamically constrained from freely migrating to the surface. Nano sized-fillers were selected due to their high surface-to-volume ratio. This new use of nano-fillers for polymers was demonstrated with a biomedical polyurethane and a surface coated nano-clay that thermodynamically attracts the additive in the polyurethane.

SuPing Lyu

Date submitted: 20 Nov 2008

Electronic form version 1.4