Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Investigation of Flame Retardancy, Mechanical Properties, and Bicompatibility of Polystyrene Blends[1] LIUDI ZHANG, SEONGCHAN PACK, MIRIAM RAFAILOVICH, Stony Brook University — Our research focused on thermal, mechanical properties, and cytotoxicity of Polystyrene system. Brominated Polystyrene was incorporated to replace halogenated Flame Retardant in Polystyrene blends. We have previously shown that ditallow functionalized clays could become nearly universal class of compatiblizers [si-2006]. Here we show that a new type of surface with Resorcinol bis (biphenyl phosphate) (RDP) could achieve the same goal. We demonstrate the strong compatibilization on this highly immiscible system. Furthermore, we show that this system also works well, when a flame retardant Antimony Trioxide (AO) is added. Tensile test, dynamic mechanical analysis, and UL-94 flame test were applied to investigate this system. We found that the amount of AO used could be minimized by adding RDP clay, which could also increase some mechanical properties that Cloisite 20A clay couldn't. Besides, we evaluated the cytotoxicity of Cloiste 20A and RDP clay. These clays were tested both within PS blends and as a monolayer film. Langmuir-Blodgett trough and atomic force microscopy were used to make and check monolayer clay. Confocal laser scanning microscopy was used to assess cell morphology. The results showed RDP clay has potential for biomaterial applications.

[1]Supported by NSF-DMR-MRSEC.

Liudi Zhang
Stony Brook University

Date submitted: 27 Nov 2012 Electronic form version 1.4