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Evaluation of Flame Retardancy, Mechanical Properties, and Biocompatibility of HIPS/PBrS Blends[1] LIUDI ZHANG, SEONGCHAN PACK, Stony Brook University, CORALIE BEAULIEU, Polytech'Nantes, France, MIRIAM RAFAILOVICH, Stony Brook University — Our research focused on thermal and mechanical properties of High Impact Polystyrene (HIPS) system. Brominated Polystyrene (PBrS) was incorporated to replace halogenated Flame Retardant (DB) in HIPS 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 goals. We demonstrate the strong compatibilization on the highly immiscible systems of HIPS/PBrS. Furthermore, we show that this system also works well, when a third component, Antimony Trioxide (AO) is added to provide flame retardant properties. Tensile test, dynamic mechanical analysis, and UL-94 flame test were applied to investigate this system. We found that the amount of AO used in flame retardant formulations could be minimized by addition of RDP clay, which could also increase some mechanical properties that Cloisite 20A clay couldn't. Besides, we evaluated the toxicity of Cloiste 20A and RDP clay. Langmuir-Blodgett trough and atomic force microscopy were used to make and check monolayer clay. Confocal Microscopy was used to assess cell morphology. The results showed RDP clay has potential for biomaterial applications.

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