Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Non-halogen Flame retardant High Impact Polystyrene Composites MIRIAM RAFAILOVICH, MAYU SI, JONATHAN SOKOLOV, Dept. of Materials Science and Engr., Stony Brook Univ., JOSHIA OTAIGBE, School of Polymers and High Performance Materials, Univ. of Southern Miss., VLADIMIR E. YUDIN, Head of Polymer Composites Lab, Inst. of Macromolecular Compounds, Russian Academy of Sciences — In recent years, driven by the health issues and the incurred banning policy of bromine compounds, it is a great demand to find an alternate to replace brominated compounds in polymer flame retardant industry. High impact polystyrene (HIPS), a popular materials widely used for electrical appliances and electronic instruments, attracts extensive attention for its dominant flame retardant agent, decabromodiphenyl ether. Here we propose a novel idea to prepare non-halogen HIPS self-extinguishing composites based on the combination of phosphorus compounds and clay. The combustion behavior was thoroughly investigated by UL 94 V-0, LOI, and cone calorimeter measurements. The addition of Cloisite 20A dramatically decreases the value of LOI and the resulted HIPS composites could not pass UL 94 V-0. On the other hand, the introduction of thermal stable clay significantly increases the value of LOI and the corresponding HIPS composites can successfully self-extinguish. These results strongly demonstrate that the thermal stability of clay is the key factor to determine the final flame retardant performance. The synergy between the clay and phosphorus compounds is further studied.

Radha Ramasamy
Department of Materials Science and Engineering, Stony Brook University
Stony Brook, NY 11794

Date submitted: 06 Dec 2005 Electronic form version 1.4