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Third International Conference Environmentally Friendly Fire Retardant Systems

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The Third International Conference on Fire Retardancy of Polymeric Materials was held in Atlanta, Georgia, USA on December 7–8, 1993. The Conference focused on the latest developments in zero- and low-halogen additives and polymers used to minimize flammability, smoke, fume, and toxicity problems. This was an intensive and executive-level meeting for compounders and technical specialists using fire retardants (FR) in plastics, textiles, wire and cable, and furniture applications; business development managers who follow specialty chemical and additive markets; health, safety, insurance and regulatory affairs managers; and materials, equipment and testing/measurement specialists in the fire safety industry. The exhibition of fire retardant additives and instruments was arranged in the frame of the conference. The participants took the opportunity to discuss their needs with the exhibitors and to discover new sources of equipment, materials, and services.

The conference was addressed to fire retardant users from various industries including polymers and composites, wire and cables, wood materials, textiles and furnishing, building materials, paper and boxboard, foams and laminates, public transportation, wall coverings, conduit and pipe, office equipment, and automotive interiors. The conference gave a balanced picture of recent progress in the development and use of advanced fire retardant systems. The participants learned about the latest innovations in the \$1.5 billion global FR business, which is forecast to grow 8% per year through the 1990s. They also found out about the demands from the environmental constituency and customers for environmentally friendly FR additives and polymers. Presently, there are no regulations anywhere to prohibit the use of halogenated FRs, but this is under active debate in many countries. End-users in such industries as wire and cable, molded plastics, transportation, textiles, and coatings and packaging increasingly ask for halogen-free and halogen FRs. Following these needs, the conference gave strategic information about the

changes underway in FR markets, where environmentally friendly FRs are headed, who the innovators are, and what works in specific applications.

The conference was open by the remarks of Dr. Hugh D. Olmstead, President of Intertech Corporation (USA), and the introduction and market overview by James D. Innes, the Conference Chairman and President of Flame Retardants Associates, Inc. (USA). In total about 20 lectures were presented at the conference, and the keynote was given by Dr. Andrea Fluthwedel (Federal Environmental Agency, Germany). The speaker described the situation in Germany and activities in the European Community. She especially focused on the regulatory activity affecting fire retardants in Germany and the EC, industry's response, likely future actions, and FR use in the EC.

New halogen-free flame retardant was discussed in the lecture of Vijay Kotian (Furon Company, USA). This low smoke compound is supposed to be applied in shipboard cable. The lecture of Dr. Louis T. Dixon (Ford Motor Company, USA), entitled "Environmental Management: Conflict or Opportunity," mainly concerned itself with the automotive industry as a major player. Flame retardant polymeric systems using low FR loading levels were considered by Edward A. Myszak, Jr. (The PQ Corporation). Typical FR systems require loadings from 15 percent up to 62 percent. The high loadings result in either objectionable off-gases or poor physical/aesthetic qualities in the polymer. New antimony/halogen systems require only a 1 percent level for FR achievement.

An environmental index for fire retardants was proposed by Dawn Roberts (School of Textile Studies, Bolton Institute, UK), who compared FR textiles from cradle to grave. The main conclusions were extended to other textiles. Professor James E. McGrath (Virginia Polytechnic Institute/State University, USA) gave a very interesting lecture entitled "New Fire Resistant Triphenyl Phosphine Oxide Containing Homo-, Statistical- and Segmented-Block Copolymers." The speaker presented a new family of materials for engineering thermoplastics, films and fibers. These materials are characterized by stable phosphorus aryl/bonds that are different from phosphite additives. Professor McGrath also emphasized two-stage thermal oxidative degradation with char formation to be the unusual feature of these materials.

New phosphorus flame retardants for nylon and polyester fibers were considered by Mark Huggard (Albright and Wilson Americas, USA), whereas Mandy J. Herbert (Alkan Chemicals Ltd., USA) discussed the mechanical, flame, smoke, and toxic gas performance of cable polymers. Indoor cables and their applications were described in greater detail in the lecture of Naren I. Patel (Siecor Corporation, USA) entitled, "Fire Safety and Optical Fiber Cables." The speaker discussed fire safety standards, testing methods, current practices in cable industry, and some market opportunities. The president of FRC Technologies, Inc. (USA), Roger Young, addressed his communication to the use of and regulations requiring FR paper and packaging. The types and functions of FR systems for paper and packaging, application methods, and testing methods were considered mainly from economic and environmental points of view.

The successful application of magnesium hydroxide for environmental flame retardancy of polyolefins was emphasized in the communications of Donald K.

Wiseman (AmeriHaas, USA) and Ronald J. Mureinik (Dead Sea Periclase Ltd., Israel). Ronald L. Markezich (Occidental Chemical Corporation, USA) described this compound in combination with chlorinated flame retardants. This mixture shows a synergistic effect in the oxygen index test, which permits lower FR loadings. The speaker also discussed the regularities of ABS-plastic and polyolefin flame retardancy with Dechlorane Plus and brominated FRs. The theoretical aspects of the application of halogen-free fire retardants were discussed in the lecture of Professor Charles A. Wilkie (Marquette University, Milwaukee, USA) in his lecture "Grafting Onto Polymers for Flame Retardancy." One of the leading experts in the area of polymer flammability, Professor Wilkie gave some convincing examples of successful use of halogen-free FRs, but emphasized that this is not extended to all polymers.

Finally, the environmental and economic problems of fire retardants were discussed in the communications of Remko Goudappel (DSM Melamine Americas, Inc., USA) "Melamine Products: The link between Flame Retardancy and the Environment"; Aram Mekjian (BP Chemicals, Inc., UK) "Rediscovery of Phenolic Composites for Safe Use in Enclosed Areas"; and Frederic P. Schall (Atlas Electric Devices Company, USA).

The next conference is proposed for December 6-7, 1994 in Chicago, Illinois.