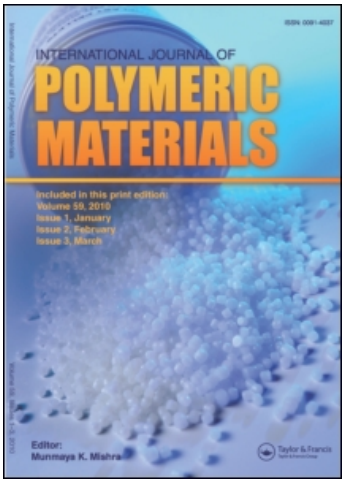

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VI European Meeting on Fire Retardancy of Polymeric Materials

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The VI European meeting on Fire Retardancy of Polymeric Materials was held in Lille (Cite Scientific) at Ecoile Nationale Superieure de Chimie de Lille (ENSCL) France on September 22–24, 1997. The previous V Conference was in Salford University (Manchester, England) in September 1995. Prof. Rene Delobel (ENSCL) was chairman of Organizing Committee and Drs. S. Bourbigot and M. Le Bras from ENSCL were members of General secretariat. The international scientific committee included Prof. G. Camino (University of Torino, Italy), Dr. J.-M. Catala (Institut C. Sadron, Strasbourg, France), Dr. Dewitt (Solvay, Brussels, Belgium), Mr. F. Gensous (Elf Atochem, Lacq-France), Dr. M.-L. Hardy (Albermarle, Baton Rouge, USA), Prof. A.-R. Horrocks (Bolton Institute of Higher Education, UK), Prof. M. Lewin (Polytechnic University, NYC, USA), Prof. E. Marechal (Groupment Francais des Polymeres, France), Prof. R. Mulhaupt (University of Freiburg, Germany), Dr. D. Price (University of Salford, UK), Prof. J. Wang, Beining Institute of Technology, China, Prof. G. E. Zaikov (Russian Academy of Sciences, Moscow, Russia).

Scientists from 25 countries (France, USA, Germany, Israel, China, Russia, Belorussia, Italy, UK, Japan, Belgium, The Netherlands, Austria, Croatie, Hungary, Sweden, Norway, India, Switzerland and Romania) contributed in the conference. 35 plenary lectures were

presented which also included sessions on Polymers and Composites with 16 lectures, and Textiles, Wood and Fibres with 15 lectures as well as poster sessions with 40 posters.

The meeting was opened with remarks of Prof. Rene Delobel, who emphasized the present interest of science and practice of the aforesaid problems. Mr. F. Henry from Assemblee Pleniere des Societés d' Assurances Dommages, (Paris, France) gave opening the lecture with information about insurance system in France in case of fire.

The first main lecture of conference was presented by Prof. Menachem Lewin (Herman F. Mark Polymer Research Institute, Polytechnic University, Brooklyn, New York, USA) about Physical and Chemical mechanisms of flame retardancy of polymers. On behalf of scientifical group (L. Costa – Uinversita di Torino, J. M. Catala – Institute Charles Sadron, Strasbourg, France, K. M. Gibov-Research Institute for Chemical Science, Alma Aty-Kazakhstan), A. V. Gribanov (Research Institute for High Molecular Compounds, St. Petersburg-Russia), S. V. Levchik (Belorussian University, Minsk, Belorussia), N. A. Khalturinskij (Research Institute for Synthetic Polymeric Materials, Moscow, Russia), Dr. Levchik spoke about mechanism of action of halogen – free fire retardants and development approaches to design of new fire retardants with reduced environmental and health impact. Dr. D. Price gave information about Laser Pyrolysis/time-of-flight mass spectrometry studies pertinent to the behavior of flame retarded polymers in real fire situations. This report was prepared by scientifical group: F. Gao, J. Milness (both from Science Research Institute, University of Salford, Manchester, UK), B. Eling (International Research and Development, ICI Chemicals and Polymers Ltd, Cleveland, UK), C. I. Lindsay, P. T. McGrail (both from Composite Science Workshop, ICI Chemicals and Polymers Ltd, Cleveland, UK). The lecture of Dr. J. E. J. Staggs (University of Leeds, Novell, Leeds, UK) was devoted to Modelling the effect of solid-phase additives on thermal degradation of solids. On behalf of group from the Research Institute for Synthetic Polymeric Materials, Moscow, Russia (M. Yu. Yablokova, T. A. Rudakova, A. V. Antonov, N. A. Khalturinskii), Dr. I. S. Reshetnikov presented the lecture "Special features of bubble formation during intumescent systems burning". Transition between regimes in the degradation of thermoplastic polymers was presented by Dr. C. Di Blasi (Universita

di Napoli, Italy). Prof. J. Wang (Beijing Institute of Technology, Beijing, China) spoke about studies of thermal degradation and charring of polymers by XPS/TGA. Two important reports were presented by Drs. Takashi kashiwagi and John W. Gilman (both from National Institute of Standards and Technology, Gaithersburg, USA). Dr. T. Kashiwagi was speaking about New flame retardant additives (coathors J. W. Gilman, N. R. Nyden, S. M. Lomakin from the Institute of Biochemical Physic Russian Academy of Sciences), the topic of J. M. Gilman's lecture (co authors T. Kashiwagi, J. Lichtenham from Philips Laboratory, Edwards Air Force Base, CA USA) was Nanocomposites: a revolutionary new flame retardant approach the lecture of Prof. G. Camino (co author P. Luda) reviewed work in the area of intumescence mechanisms. He showed that the "intumescent" behaviour resulting from combination of charring and foaming of the surface of the burning polymers is being widely developed in fire retardancy because it is characterized by a low environmental impact. Polymer composites for manual applications was discussed in the lecture of F. Le Lay and J. Gutierrez (DGA-DCNB, Construction Navale, La Montagne, France). Group of scientists: S. V. Levchik A. I. Balabanovich G. F. Levchik (Research Institute for Physical Chemical Problem, Byelorussian University, Minsk, Belorussia), Ch. Wilkie (Department of Chemistry, Marquette University, Baton-Rouge, USA), G. Camino (Universita di Torino, Italy) reported about the relationship between cross-linking-charring and fire retardancy in high energy irradiated nylon 6. Photooxidation of fire retarded polypropylene was the topic of lecture of J. L. Gardette, C. Sinturel and J. Lemaire (Universite Blaise-Pascal, Laboratoire de Photochimie Moleculaire et Macromoleculaire, Aubiere, France). G. Anthony (FMC Corporation, Manchester-UK) spoke about kinetic and chemical studies of polymer cross-linking using thermal gravimetry and hyphenated methods. The report of I. G. Assovskii (Institute of Chemical Physics, Moscow, Russia) Convered the thermal regimes of heterogeneous reaction in porous material and smoldering to combustion transition. Some aspects of mechanical stability of intumescent chars were presented in the lecture of prof. A. A. Berlin (Institute of Chemical Physics, Moscow, Russia (co authors I. S. Reshetnikov, M. Yu. Yablokova, N. A. Khalturinskij from the Research Institute for Synthetic Polymeric Materials,

Moscow, Russia). The lecture of Prof. A. R. Horrocks (Bolton Institute of Higher Education, UK) and B. K. Kandola (Dept. Of Textiles, Faculty of Technology, Bolton Institute, Bolton, UK) was dedicated to flame retardant cellulose textiles. Ecological Aspects of polymer flame retardancy were discussed in the lecture of prof. G. E. Zaikov (Institute of Biochemical Physics), with co author S. M. Lomakin from the same institute. Participants of conference have discussed with great interest information presented in reports of Dr. R. Dewitt (Solvay, Brussels, Belgium) about the European regulations in the field of flammability of polymeric materials, prof. M. L. Hardy (Albermarle Corporation, Baton-Rouge, USA) about regulatory status and environmental properties of brominated flame retardant undergoing risk assessment in the EU and Drs. M. Checchini, C. Cecchini, B. Cellarosi, F. O. Sam (EniChem Research Centre, Porto Marghera, Venezia, Italy) about the use of cone calorimeter for evaluating of fire performances of polyurethane foams.

The next 4 reports were devoted to standards, tests and equipments of flammability study (J. Troitzsch, Fire and Environment, Protection Service, Wiesbaden-Germany), a cone calorimeter test for the measurement of flammability properties of insulated wire (P. J. Elliot, R. H. Whiteley Raychem Ltd, Corporate Technology, Europe, Swindon, UK), combustibility and toxicity of board materials used for interior fittings and decorations (R. Kozlowski, D. Wesolek, M. Wladyka-Przybylak Institute of Natural Fibers Science Information Centre, Poznan, Poland), regulations on flammability in aerospace (J. E. Petit, A. Mansuet, Toulouse, France).

Three last plenary lectures were devoted to problems of lowering of flammability of polymeric materials (prof. Rene Delobel), property evaluation of flame retardant polymeric materials using a range of instrumental techniques (J. P. Redfern Rhemethric Scientific Ltd., Epsom, Surrey UK) and decreasing the flammability of polymeric materials for space programmes (D. Rebuffat, J. F. Petit, A. Mansuet, M. Ferie (DGA-CEAT, Toulouse-France); V. Cervantes, M. Vachon (BERTIN et Cie, Tarnos-France).

Between different topics which were discussed in the session on Polymers and composites we have first of all to show the information about new flame retardant systems for styrenic plastics and method to prepare them, developments in the use of magnesium hydroxide as a

fire retardant filler for thermoplastics, influence of the incorporation of several talcs in a PP-PE copolymer flame retarded by a brominated trimethylphenyl indane/antimony trioxide blend, halogen-free flame retarded thermosets, properties of flame retarded polystyrene, latest developments in the flame retardancy of engineering thermoplastics, thermal properties and flammability of polyarylenes and their modifying products, new ecological polyester resins with reduced flammability and smoke evolution capacity, brominated copolymers of reduced flammability, resorcinol bis (diphenyl phosphate), as a non-halogen flame retardant additive, the use of organophosphorus functionality to modify the thermal and fire retardant behavior of polyamides, use of zinc borate in the flame retardancy of some polymers.

The most important reports of the session on Textiles, Wood, and Fibers were devoted to the; flammability of novel fire resistant textiles, burning behaviour of tropical wood, flame retardant composites with a review of the use of intumescent/fibre composites, flame retardant treated plywood, mechanistic study on fire retardant action of fluorine-containing additives in ABS, flame retardant alkyd paint, fire resistant lignocellulosic-mineral composite particleboards, heterocyclic additives and stabilizers for polymer materials.

The poster's information covered very broad field of decreasing of flammability of polymers and copolymers.

250 scientists from 100 research centres took part in this conference. Finally this was not a European, but a world conference, because the scientists from Europe, America, Asia and Africa took part in this meeting.

The conference was a very high level and showed that either fundamental research of polymer flammability or practical application of novel flame retardants successfully develop.

The next VII European meeting on Fire Retardancy of polymeric materials is scheduled on September 10–12, 1999 in University of Greenwich, London, England. The organisers of the conferences are Prof. Metcalfe from School of Chemistry and Life Sciences, University of Greenwich, Wellington Street, Woolwich, London SE186PE and Dr. Dennis Price from University of Salford, Salford, Manchester, UK. The main organiser of the next conference is Fire chemistry discussion group (UK).