

**IUPAC MACROMOLECULAR DIVISION (MMD)**  
**Final Draft Minutes of the Meeting held in Ottawa, 9-10 August 2003**

The Macromolecular Division Committee met on 9-10 August 2003 from 9:00 – 14:00 at the IUPAC General Assembly in Ottawa, Canada at the University of Ottawa. Those attending: Prof. G. Allegra (Italy), Dr. R. Bailey (UK), Prof. D. Berek (Slovakia), Prof. M. Buback (Germany), Prof. T. Chang (Korea), Prof. G. Costa (Italy), Prof. L. Dai (USA), Prof. R. Gilbert (Australia), Prof. J. He (China), Prof. M. Hess (Germany), Prof. K. Horie (Japan), Prof. A. Jenkins (UK), Prof. J.-I. Jin (Korea, Vice-President), Prof. R. Jones (UK), Prof. S. C. Kim (Korea), Prof. T. Kitayama (Japan), Prof. P. Kratochvíl (Czech Republic), Prof. P. Kubisa (Poland), Dr. M. Laun (Germany), Dr. W. V. Metanomski (USA), Prof. W. Mormann (Germany), Prof. J.-P. Pascault (France), Prof. S. Penczek (Poland), Dr. B. Saunders (UK), Prof. R. Sanderson (South Africa), Prof. M. Sawamoto (Japan), Prof. S. Slomkowski (Poland), Prof. R. Stepto (UK, President), Prof. J.-P. Vairon (France), Prof. J. Vohlídal (Czech Republic), Prof. F. Wang (China), Dr. E. Wilks (USA), Dr. W. J. Work (USA, Secretary).

**1. President's Introductory Remarks and Finalization of the Agenda**

- 1.1. Prof. Stepto welcomed everyone to Ottawa.
- 1.2. Prof. Stepto noted that Prof. Becker had requested time on the agenda to discuss changes to the conference approval procedure and to allow the Division to discuss its needs with representatives of the Secretariat. Also, Prof. Atkins of the Committee for Chemical Education has requested time to solicit Division participation in CCE's activities.

**2. Approval of the Minutes of the Division Committee Meeting, Beijing, 2002.**

- 2.1. Prof. Gilbert moved that the 2002 minutes be approved as the record of discussion and decisions reached at the Beijing meeting. The minutes were approved unanimously without discussion.

**3. Matters Arising.**

- 3.1. Prof. Stepto reported that, for reasons of poor health, Prof. Tabak was unable to attend this year's meeting. He also reported that Prof. Baron was unable to attend. Both members sent their apologies and good wishes.

**4. Report on Terminology and Nomenclature Projects (Hess)**

**N.B. The terminology and nomenclature projects and publications for the biennium 2002-3 can be found in the Report to Council for Division IV that is attached to these minutes.**

- 4.1. The Terminology Subcommittee currently has 24 members from 16 countries, who participate in 14 working parties, four of which are interdivisional.

- 4.2. Prof. Hess reported that there are eight old projects. One is in the final stage of preparation, two are close to the final stage, and two are in advanced stages of preparation. The remaining three old projects are the History of the Macromolecular Nomenclature Commission, the revision of the Purple Book, and the Glossary of Terminology and Nomenclature. There are also two new projects in the early stages of preparation and ten feasibility studies under consideration.
- 4.3. Over the last year, the Subcommittee has had two projects completed and published: a revision of the *Structure-Based Nomenclature of Regular, Single Strand Polymers* and the *Definitions Relating to Stereochemically Asymmetric Polymerizations*.
- 4.4. Other activities in which the Subcommittee is involved are the preparation of a publication on IUPAC Chemical Nomenclature for chemistry teachers at the secondary level and a tutorial on polymer characterization (with Prof. Brostow). Prof. Gilbert asked whether these would be available on the Division website. Prof. Hess responded that the plan was to have that in progress by year's end.
- 4.5. Prof. Hess also reported that Dr. Xavier Macossay of Mexico wishes to translate the documents produced by the Subcommittee into Spanish. Prof. Jenkins expressed concern that the translation be reviewed by scientists from other Spanish speaking countries to insure that the translation was not biased to one region of the world.
- 4.6. Prof. Gilbert asked whether polymer journals have started to publicize the URL for polymer nomenclature. Prof. Hess responded that he was not sure how generally this has been accepted by the journal publishers. Prof. Gilbert suggested that a letter from the Division President be sent to the journal editors with proposed wording. Prof. Stepto agreed to take this up at the Subcommittee meeting. Prof. Kratochvíl noted that this approach has been done previously but with very poor acceptance. Prof. Berek suggested that the approach should be to the working editors of the journals, not to the editorial board.

## 5. Report on Structure-Property Characterisation Projects (Laun)

**N.B. The structure-property projects and publications for the biennium 2002-3 can be found in the Report to Council for Division IV that is attached to these minutes.**

- 5.1. Dr. Laun reported that the working party meets twice each year. An upcoming meeting in Scotland will celebrate the 40<sup>th</sup> anniversary of the working party. The working party currently has 66 active members from 24 countries. The members are balanced between 31 academic scientists and 35 industrial scientists.
- 5.2. Dr. Laun plans to retire as the chairman of the working party. He will transfer the working party's website from its location at Bayer to the Division's website.
- 5.3. The working party has prepared a report that documents its history, output, and future prospects. The working party currently has five feasibility studies.
- 5.4. Dr. Bailey reported the activities of the task group organized to quantify the scratch resistance of commercial plastics. The task group will review the science and identify new and existing scratch resistant plastics in preparation for the start of testing. A conference paper has already been produced and it is hoped that a review paper will be completed by the end of 2003. Three research papers are planned. One difficulty that

has to be addressed is the procurement of materials for testing. The project has been approved to continue through 2005.

- 5.5. Dr. Laun reported on the activities of the working party on the project Structure and Properties of Cyclic Olefin Copolymers for Prof. Kim. The experimental work has been completed on six commercial samples that have resulted in two published papers and three more papers in manuscript. Prof. Stepto asked if this project would continue after this year. Dr. Laun responded that it probably would not, but that other projects were planned. One that has already been started is Structure of Polyester Thermoplastic Elastomers that will be coordinated by Prof. Takigawa. The first paper is planned to appear by the end of 2003.
- 5.6. In April, 2003 Prof. Wassner started a project to present Recommendations for Data Presentation Applicable to Mechanical and Rheological Measurements of Polymers. The task group consists of sixteen members mainly from industry. A document that will recommend best practices will be published in September. The recommendations will be discussed with rheometer manufacturers by March, 2004. It is also planned to find a company willing to implement the software that has been developed in this project.
- 5.7. Prof. Vairon suggested that a report of the activities of the Characterization working party should be published in a widely read periodical. He believes that this will show the importance of what IUPAC is doing for scientists. Dr. Laun and Prof. Stepto both think that the report on the History, Output, and Future Prospects of the working party should serve the need to publicize its accomplishments. Prof. Gilbert noted that the meeting of world chemical leaders at the World Chemistry Congress should provide a venue for highlighting the Division's activities and suggested that we prepare a short presentation for that purpose. Prof. Vairon also agreed to put a session on the program for the World Polymer Congress in 2004 to publicize Division output.

## 6. Report on Molecular Characterisation Projects (Berek)

**N.B. The molecular characterization projects and publications for the biennium 2002-3 can be found in the Report to Council for Division IV that is attached to these minutes.**

- 6.1. Prof. Berek reminded the Division that the working party exists because not all laboratories use appropriate characterization methods. Round-robin size exclusion chromatography tests have been performed for polystyrene, polyamide, polyethylene, and poly(sodium acrylate). However, data reduction needs to be completed for three of the polymers and much data has been lost. Prof. Podzimek is expected to complete a series of round-robin tests on epoxy resins by the end of 2003.
- 6.2. A new project to study tetrahydrofuran-soluble polymers by NMR and by MALDI mass spectroscopy combined with size-exclusion chromatography is planned. PMMA, polar polymers such as polyamide and poly(ethylene oxide), and polyolefins will be the subject of this project.
- 6.3. A paper that reports the results of the band-broadening correction study has been published. One more manuscript is in preparation. There have been problems with the slow speed with which the ICTNS reviews manuscripts for publication.

6.4. A meeting on the molecular characterization of polymers was held in Bratislava. It did not attract very much industrial interest.

**7. Report on Kinetics Characterization Projects (Buback)**

**N.B. The kinetics characterization projects and publications for the biennium 2002-3 can be found in the Report to Council for Division IV that is attached to these minutes.**

7.1. A meeting of the working party was held at the American Chemical Society meeting in Boston. The focus of the working party is the determination of reliable polymerization rate parameters to allow better modeling of polymerization reaction behavior. Four papers that have been published are highly cited, which is an indication of the value of the work. Recent publications include rate parameters for methyl methacrylate polymerization, alkyl methacrylate polymerization, and termination rate coefficients.

7.2. Prof. Buback will apply to have the working party approved as a Division subcommittee. Twenty-three scientists from ten countries have been identified to be members. He asked for suggestions for other scientists to join the working party and proposed that an assistant chairman be identified, perhaps in Asia, so that meetings can take place in geographically dispersed locations. Prof. Sanderson suggested someone from South Africa to join the subcommittee.

7.3. Prof. Sawamoto asked what role modeling has in the working party. Prof. Buback responded that it is necessary to do modeling to relate kinetics parameters to polymerization mechanisms.

7.4. Prof. Penczek asked whether the kinetics of cationic and anionic polymerization would be the subject of future work? Prof. Vairon stated that both Exxon and Bayer were interested in supporting work to measure the absolute propagation rate constants for cationic polymerization to establish whether they were diffusion-controlled or not. He asked whether this work could be submitted to the subcommittee? Prof. Buback answered that projects on these topics could proceed if someone was willing to work on them, but he did not think that the work would start very soon.

7.5. Prof. Berek wanted to know whether the working party had compared kinetics parameters obtained in different laboratories? Prof. Buback responded that 10-20% variation in the propagation rate coefficients have been observed between different laboratories. Agreement was better between laboratories when polymerization kinetics for polystyrene and poly(methyl methacrylate) were compared than for other polymers.

7.6. Prof. Berek asked whether the working party plans to work with kinetics of copolymerization? Prof. Buback reported that this has up to now not been addressed.

**8. Reports on Developing Polymer Materials Systems (Vohlídal, Work)**

**N.B. The developing polymer materials systems projects and publications for the biennium 2002-3 can be found in the Report to Council for Division IV that is attached to these minutes.**

- 8.1. Prof. Vohlídal reported for the task group leader, Prof. Stejskal, on the continuing work for the Functional Polymers project. One project has been completed and a paper published on *Polyaniline: The preparation of a conducting polymer*. A second project, *Conducting polymer colloids and nanofilms*, is planned for completion in 2004.
- 8.2. Two other areas with the potential for new projects for the Division were presented. The first, polymer systems with applications in medicine and biosciences, offer opportunities at the interfaces between polymer chemistry and biology, medicine, pharmacology, and bioengineering. The second area focuses on field-responsive polymer systems with application in electronics, opto-electronics, sensors and related fields; here interfaces exist between polymer chemistry and solid-state physics, biophysics, and electronic engineering. For both areas, it will be necessary to build multi-disciplinary teams to effectively address the topics. Terminology, characterization, and standardization projects may all be possible. Several scientists have already expressed an interest in working on both topics. For the projects related to medicine and biosciences, Prof. Frantisek Rypacek, Prof. Karel Smetana (medicine), and Prof. Nakabayashi have responded with interest in joining a working party. In addition, Prof. Penczek has identified Ramani.Narayan, Emo.Chiellini, Michel Vert and Yoshikari Doi as scientists who may be interested in participating. Prof. Penczek commented that the scientists he has contacted are already involved in a project that focuses on the characterization of polymer biodegradability that should also be a subject for the working party. He further suggested that projects related to biomedical polymers, nomenclature for biodegradable polymers, and nomenclature for biomacromolecules be developed. Prof. Sawamoto commented that there is a need to move quickly to start work in these areas; he suggested Professor Kazunori Kataoka, Professor Shunsaku Kimura, and Professor Hiroo Iwata as possible participants. For field-responsive polymers, Prof. K. Horie, Prof. J.-I. Jin, Prof. J. Pflieger, and Prof. Vohlídal are all willing to become involved in the working party. Prof. Vairon noted that WPC 2004 will have three sessions devoted to these topics. Prof. Vohlídal asked whether Prof. Vairon could suggest others who could be involved in the Division's initiative from the invited speakers to these sessions. Prof. Gilbert commented that the these projects extended beyond the Macromolecular Division and beyond the IUPAC; he noted that extra money to support inter-union projects is available from the ICSU and encouraged us to pursue that source.
- 8.3. Prof. Sanderson asked whether it would be possible to use the Division's website to solicit proposals for new projects. He envisions that projects could be solicited on specific topics as well as receiving proposals for new projects that lie outside the Division's current focus. Prof. Stepto responded that it is possible to do this. Prof. Sanderson suggests that a web page be developed that would serve to start discussion.

## 9. **Reports on Education Projects and Activities (Jin)**

**N.B. The education projects and publications for the biennium 2002-3 can be found in the Report to Council for Division IV that is attached to these minutes.**

- 9.1. Prof. Jin conveyed Prof. Khokhlov's apologies for being unable to attend to report on his portion of the Division's educational activities.
- 9.2. Division support has been provided for the polymer education programs in Prague, coordinated by Prof. Kratochvíl, in Stellenbosch, coordinated by Prof. Sanderson, in Moscow, coordinated by Prof. Khokhlov, and in Texas, coordinated by Profs. Brostow and Hess. The IUPAC is particularly interested in supporting educational programs in developing countries.
  - 9.2.1. Prof. Kratochvíl provided a short presentation on the Postgraduate Course in Polymer Science that is held in Prague. Most of the financial support is received from the Czech Academy of Sciences. That support allows five participants to be involved in the ten-month program. With additional support from UNESCO and IUPAC more scientists are able to participate. For 2003-2004 there are nine participants largely from Eastern Europe. The course consists of fifty hours of lectures on polymer science covering a variety of topics. Since its inception, the participants have produced fifty-seven published papers and seventy-three presentations at conferences. Eight more papers are in press. The papers and presentations are available on the web-site.
  - 9.2.2. Educational efforts in Africa were reported by Prof. Sanderson. Currently polymer education is aided by three CD ROM disks that are used for virtual teaching. Through UNESCO, Prof. Sanderson has ministerial contacts with Libya, Eritrea, Gabon, Zimbabwe and students are training in all of these locations. He has links to Zimbabwe University, Moi University of Kenya, and the Macromolecular Center in Libya. A UNESCO/IUPAC supported meeting is to be held in Mauritius. Prof. Gilbert noted that the meeting in Mauritius will have lectures in both French and English because a significant part of Africa speaks French. Prof. Berek asked about educational efforts in those African countries not mentioned. Prof. Sanderson responded that some of the other countries have their own active polymer programs. Prof. Sanderson noted that Prof. Economy had requested that an organization focused on polymer education for all of Africa be developed.
- 9.3. Prof. Jin reported that \$125,000 donation was given to the Division by the Samsung Corporation. It is intended that the donation be used to support the Division's educational activities. The donation will be invested to provide an endowment for yearly support. Prof. Jin proposed that a small committee should be formed to decide how to use the endowment. Prof. Stepto noted that this is the first such donation in direct support of specific IUPAC activities. Prof. Jin asked whether it would be possible companies in other countries to contribute? Some companies have been contacted by Prof. Hess for support; however, this has not yet been successful. Prof. Berek suggested that it is not very expensive for companies to support IUPAC and, therefore, it should be easy to convince them. Prof. Laun responded that much of the financial support for national adhering organizations comes from industry and that it is actually quite costly for a company.
- 9.4. Profs. Vairon and Jin suggested that the Characterization Subcommittee become more involved in education initiatives. Dr. Laun responded that, in principle, it could be done.

- 9.5. Prof. Jin urged the members of the Division to support the Committee for Chemical Education. Prof. Atkins, the chairman of the Committee for Chemical Education visited to find out about the Division's educational program. He asked whether the Division works for a better public understanding of polymer science? Prof. Stepto responded that we are not involved and he was unsure about whether this was something that the Division could do. Prof. Atkins stated that a chemical education web-site is being developed and asked whether we were interested. Prof. Stepto responded affirmatively. Prof. Kratochvíl asked about his application for funding from CCE for his post-graduate course and why it was turned down since it is a continuing activity. Prof. Atkins and Prof. Stepto both responded that they had supported the application, but that it had been turned down at a higher level in IUPAC.
- 9.6. Prof. Stepto requested that the outcomes of courses be available to provide justification for continued IUPAC support. He also suggested that there are opportunities for funding in support of educational activities such as tutorials that take place at conferences. This was the path followed to provide support for the POLYCHAR meeting each year. Prof. Hess stated that the financial support provided to POLYCHAR has been used to help students not faculty. According to Prof. Stepto, COCI also provided support for POLYCHAR this year. Prof. Berek suggested that it should be possible to develop short courses in molecular characterization of polymers and asked how to obtain support? Prof. Stepto responded that a project proposal may be for either a single event or a series of events; however, it is desirable to focus the financial support to allow participants from developing countries to attend. Dr. Laun also suggested that there is material already developed by the Characterization subcommittee that could be useful for educational purposes.
- 9.7. The difficulty to motivate students to study chemistry was addressed by Prof. Wang. He suggested that the Division become involved in publicizing what chemistry does to improve peoples' lives. Prof. Jin responded that this is the mission of CHEMRAWN.

## **10. New Project Areas**

- 10.1. Prof. Stepto noted that a number of potential new projects have already been discussed such as propagation rate coefficients for cationic and anionic polymerization, biomaterials, biodegradation, biomedical materials, field responsive polymers, biophysics terminology, and distance learning. Dr. Laun noted that molecular modeling of systems had also been suggested. Prof. Sanderson suggested nanomaterials and smart materials. Prof. Penczek asked whether combinatorial chemistry could be a possibility? Prof. Stepto responded affirmatively and Prof. Vairon noted that WPC 2004 would have sessions devoted to combinatorial chemistry as well as many of the other areas that have been suggested.
- 10.2. Prof. Becker reported, during his visit to the Division meeting, that funds are still available for projects. He encouraged any who wish to take advantage of the remaining funds to submit their proposal quickly.

## **11. Reports on Division-Sponsored Conferences (Kubisa, Penczek) and forthcoming World Polymer Congresses (Vairon, Tabak, Lee, ...)**

**N.B. The conferences sponsored through the Macromolecular Division and the publications resulting from them for the biennium 2002-3 can be found in the Report to Council for Division IV that is attached to these minutes.**

- 11.1. A short enumeration of Division sponsored conferences was presented by Prof. Kubisa. From 1998, when three conferences were sponsored, the Division has approved about ten conferences per year in 2001, 2002, and 2003. For 2004, four conferences have received Division approval. Eight issues of Macromolecular Symposia, three in 2003, have been devoted to Division-sponsored symposia.
- 11.1.1. Prof. Vairon provided updated information on the progress towards the World Polymer Congress to be held 4-9 July, 2004 in Paris. All preparations are nearing completion and the first circular is now ready. The Conference web-site is almost complete. The program committee has four representatives from industry including AtoFina and Michelin. The plans include nine topic areas, twenty-one symposia, ten plenary lectures, 250 invited lectures (95% already contacted with 99% acceptance), 350 oral presentations. There is good geographical representation among the invited lecturers with 56% from Europe, 31% from North and South America, and the remainder mostly from Japan and Australia. Support is being provided for students in the form of fee waivers and some provided lodging; many of these students are from developing countries. There is also some support for scientists from developing countries. There was a great deal of discussion about how to use the Samsung money to aid this conference. A proposal to provide a "Samsung Award" to a young scientist was deemed to be unacceptable because it was likely to cause problems with the companies that are providing direct support for the conference in France. However, to call it the IUPAC award was not viewed as acceptable to Samsung. It was decided that the matter be resolved by a small working group consisting of the executive committee, Prof. Vairon and Prof. Pascault.
- 11.1.2. Prof. Tabak, *via* e-mail, reported that work continues towards organizing the World Polymer Congress in 2006 in Rio de Janeiro. The conference is using the same organizing committee as was used for a recent successful Oil and Gas meeting. Prof. Gilbert agreed to obtain a list of the organizing committee to determine whether it is appropriate for the World Polymer Congress. Prof. Stepto suggested that a definite progress report is necessary in 2004.
- 11.1.3. There has been no new information about the progress towards the World Polymer Congress in 2008 in Taipei. Both Profs. Gilbert and Stepto expressed the necessity to find out who is in charge and what the state of organization is. Subsequent correspondence identified Profs. An-Chung Su, Kan-Nan Chen, and Wen-Chang Chen as the scientists responsible for organizing the WPC.
- 11.2. Prof. Penczek reported that a meeting on bio-related polymers will be held in November in Japan. It was a Gordon conference, but it is now under IUPAC sponsorship. Profs. Kubisa and Penczek approached the organizers to propose that they seek IUPAC support. Prof. Penczek suggested that Division members actively work to identify conferences that may qualify for Division support.
- 11.3. Prof. Penczek asked who is to write the report on a conference. Prof. Stepto responded that the procedure is changing so that the conference editor, who may not be present at



- the conference, will write the report; however, this is not desirable. An IUPAC representative attending the conference would be more appropriate. Prof. Becker responded to this proposal to say that it would be taken up at the General Assembly.
- 11.4. Prof. Kubisa noted that it is required that *Macromolecular Symposia* be given the first opportunity to publish the conference proceedings of IUPAC sponsored conferences; however, conference organizers are often interested in publishing elsewhere. Prof. Sawamoto suggested that some authors do not wish to publish in the proceedings because the issues are slow to appear. Prof. Berek noted that *Macromolecular Symposia* is not peer reviewed and thus the quality of the work published is not high. Prof. Gilbert suggested that the Division should seek a higher impact journal. Prof. Sanderson proposed that a competition should be held between the publishers for the right to publish conference proceedings. Prof. Sawamoto suggested that the most important point is that the proceeding be published quickly. Prof. Stepto stated that it is important that publications result from conferences. IUPAC sponsored symposia have saturated *Macromolecular Symposia*, who now refuse some conference proceedings. This allows conference proceedings to be published elsewhere; the organizer can decide, but Wiley is the IUPAC publisher of choice. Electronic publication was raised as an alternative method. Prof. Penczek noted that electronic publication can be accomplished within eight weeks, but the speed of publication is often related to the rate of preparation of manuscripts by authors. Strict deadlines are required. Dr. Meyers noted that conference proceedings often cannot be reported on-line because they have been published elsewhere with restrictions on duplication; this violates the IUPAC mandate that its publications be freely available. Prof. Gilbert noted that some reports have been published simultaneously in IUPAC journals and elsewhere; he asked whether it would be possible to connect important publications in PAC to other publications such as *Chemical and Engineering News*? Dr. Meyers responded that Laura Abernathy is responsible for sending approved documents on to journals and that a semi-weekly e-mail newsletter to inform all of the plans for publication of documents is planned. Prof. Berek suggested that the Division should have its own journal for conference proceedings. Prof. Stepto noted that *Pure and Applied Chemistry* is also a possible location for proceedings. Prof. Bull commented that PAC will publish conference proceedings that emphasize emerging or multidisciplinary topics and that PAC would rely on the Divisions for peer review. Prof. Vairon suggested that the Division should have control over where major contributions from the big meetings be published. Perhaps they should be in e-journals such as ACS preprints, which also includes posters. Prof. Sanderson suggested that the web-site be used for reviewing manuscripts as that would speed things along. During the joint meeting with representatives of the Secretariat Prof. Stepto noted that IUPAC selected Wiley to publish conference proceedings and that it has the right of first refusal; it has refused some recent proceedings, which has led to undesirable delays. Prof. Becker responded that we should discuss publication in PAC with Prof. Bull and to talk to Dr. Jost about the exclusivity problem. It is Prof. Becker's belief that the Division should be free to publish in the most appropriate journal. Prof. Bull suggested that criteria be set for what is published in PAC rather than *Macromolecular Symposia*. Prof. Sawamoto asked what the editorial policy is for publication in PAC. Prof. Bull responded that PAC publishes the output of IUPAC

bodies. Prof. Gilbert noted that his interpretation of the contract with Wiley, which he agreed to make available to the Division Committee, would allow renegotiation in 2004.

- 11.5. Prof. Becker suggested that funding is available for conferences in novel areas, e. g. nanomaterials, where a small amount of money could be helpful. The conference evaluation committee recommends that conferences be held in developing countries. He also suggested that IUPAC support be applied to aid a lecturer to attend rather than for general support for the conference.
- 11.6. Prof. Stepto noted that conferences will be approved by a different path in the future and asked Prof. Becker to elaborate. Prof. Becker stated that the new rules require that a conference organizer seeking IUPAC approval first submit the conference proposal to the Division and that the Division then submits it to the Secretariat. This differs from the old path in which the conference proposal was submitted to the Secretariat, which would then send it to the appropriate Division(s) for approval. Prof. Becker also noted that Division approval does not imply a commitment of funds.

## **12. Recruitment to the Division (Gilbert)**

- 12.1. One of the main vehicles that the Division uses to help recruit scientists into the Division's activities is the brochure that it provided to all scientists who register at Division sponsored conferences. Prof. Gilbert stated that, as he is responsible for the brochures, he needs to be informed about conferences so that the brochures will be available. Prof. Stepto asked that Profs. Kubisa and Penczek insure that Prof. Gilbert is aware of upcoming conferences.
- 12.2. Prof. Gilbert reported that the Division's brochure was included in the registration materials provided to those attending the World Chemical Congress being held simultaneously with the General Assembly in Ottawa.
- 12.3. The Division's brochure is prepared through the Conference Coordinator (Kubisa) who sends the brochure and Power Point slides electronically to the conference organizing committee with a request that the organizing committee reproduce the brochure for the attendees. Prof. Hess suggested that the brochure be targeted to conferences in fields where we perceive a need for new people to be involved in projects.
- 12.4. The responsibility of the Conference Coordinators will be expanded to include recruitment.
- 12.5. Prof. Horie pointed out that a duty of members of the Division should be to identify scientists who are willing to participate from each of their countries.

## **13. Report on Division Web Page and Electronic Publications (Jones, Work)**

- 13.1. Prof. Jones reported that only Prof. Stepto has suggested additions to the Division's web-site. All are invited to make suggestions. Dr. Laun noted that the Structure-Property Characterization Working Party has its own web-site, which will be transferred to the IUPAC web-site; he wants have links to the Division's web-site established.
- 13.2. Prof. Kratochvíl asked whether all nomenclature and terminology documents are available on the web-site. Prof. Stepto responded that they were. Prof. Hess added

that Division VIII wants to put our nomenclature documents on its web-site; Prof. Stepto agreed.

- 13.3. Prof. Hess commented that search engines find sites based upon the number of links to that site; he suggested that we should get the Division's site linked to as many other sites as possible. Prof. Jones responded that it is also necessary to have as many keywords as possible on the site and Prof. Gilbert further commented that the keywords should be in the URL. Prof. Gilbert also suggested that we establish an e-mail linkage to other polymer scientists. Prof. Hess commented that journal editors and reviewers should also be connected by e-mail to the Division.
- 13.4. Prof. Gilbert asked whether only one version of a document is available on the web-site? Prof. Hess responded affirmatively. Prof. Gilbert suggested that the web-site should be inspected to insure that only the correct version is available. Dr. Metanomski noted that some Division documents are not on the Division's site, they are on Prof. Moss's. Prof. Stepto proposed that links be established between our site and others where our documents appear.
- 13.5. Prof. Gilbert proposed that we need to ensure that Fabienne Meyers receives the latest address list.

#### **14. Strategy, Communications, Polymer Summit (Jin, Horie, Wang)**

- 14.1. Prof. Jin reminded Prof. Vairon that a room needs to be assigned for the Polymer Summit at WPC 2004. Prof. Vairon responded that a two-day symposium on strategy will be held there. It will cover international cooperation between industry and academia, between government laboratories and industry, between countries, and finally the Polymer Summit. Prof. Gilbert commented that he thinks this will be much more proactive and expects that it will be more useful.
- 14.2. A conference on the Strategy for the Division and Strategy for Polymer Science and Technology was hosted by the Society for Polymer Science, Japan and held in Kyoto last year. The next such conference is planned for 2005 in New York. (Now delayed until 2006.)
  - 14.2.1. The conference identified several areas for future strategic interest including:
    - 1) Polymer concepts in chemistry, physics, and biology
    - 2) Frontiers in polymer science and physics
    - 3) Biological, biomedical, and environmental applications of polymer scienceThe Proceedings of the conference will appear in Macromolecular Symposia. A keynote article from the conference will appear in PAC; it will highlighting the IUPAC role in developing strategy.
  - 14.2.2. Prof. Sawamoto reported that a Division project, *Strategy Study of World Polymer Science*, now exists. Its goals are to determine trends and discoveries through statistical analysis of published papers, to develop guide book to polymer organizations (Green Booklet), to develop a mission for polymer science, and to identify challenges. The task group has eight members and a web-site to provide links between societies. As an example of the use of statistical analysis, Prof. Sawamoto showed the data gathered on the increase in

the number of publications on living polymerizations and on metal-catalyzed polymerizations over the last twenty years.

- 14.2.3. Kalle Levon is to be the organizer of the New York meeting in 2006; he has prepared the AIQ.

## **15. Budget, Projects and Division Structure (Stepito)**

- 15.1. Prof. Stepito commented on project budgets and noted that nomenclature projects benefit from Division VIII funding. The Division budget is \$35,000; 75% for projects and 25% for administrative expenses. There remains room for a few more projects. A project receives \$3000/biennium, which is fixed. If a project extension is needed for a good reason, then a supplementary project application is required. It is currently possible to obtain additional support over the Division's budget because IUPAC still has some money. It is possible to continue to spend money allocated for a budget for about one year past the deadline. Prof. Gilbert asked what the outputs have been compared to the plan? Prof. Stepito replied that that would be reported at the Council meeting. Prof. Hess asked how the current budget system compares to the old system? Prof. Stepito responded that it is larger now. Prof. Dai asked who could make a proposal for a project? Prof. Stepito replied that anyone could; an application is available at the IUPAC web-site. The task group coordinator for the subject area submits the project application for the writer. The application is then reviewed by the Division and suggested outside reviewers.
- 15.2. Prof. Stepito reported that Prof. Becker has provided a template for revised Division rules. In large part the template left blank spaces in the text to be filled in by the Division President. He requested that Division members read the new rules and provide their comments. Prof. Jenkins commented that some English corrections are needed. Prof. Sanderson noted that Commissions are still referred to in the new rules. Prof. Berek suggested that IUPAC rules will change at the Ottawa General Assembly and proposed that we delay making any changes until the new rules are available. Prof. Gilbert suggested that we may end up with restrictions on the Division's activities and proposed that we add words that will allow us to include other macromolecular topics.

## **16. Subcommittees (Hess, Buback, Laun, ...)**

- 16.1. Prof. Stepito asked Prof. Hess whether the Subcommittee for Macromolecular Terminology (SMT) wishes to continue as a subcommittee? Prof. Hess responded that it did. Approval for its continuation was put before the Division for a vote. The Division unanimously approved.
- 16.2. Prof. Stepito next asked whether Dr. Laun's Structure and Properties of Commercial Polymers task group wishes to become a Division subcommittee? Dr. Laun responded affirmatively. The Division unanimously approved this proposal. Dr. Laun noted that Dr. Bailey would replace him as the chairman of the Subcommittee and that Dr. Dick Dijkstra would become the new secretary. There will actually be four officers to allow more frequent discussions. There will be a deputy chairman and secretary in East Asia. Prof. Stepito asked that both co-chairmen and co-secretaries be in the IUPAC

Handbook. Prof. Jenkins asked whether there was only one member of the task group from the United States. Prof. Laun responded that he has tried unsuccessfully to recruit more. Prof. Penczek commented that NIST has a group involved in MALDI-TOF that could be a source for people to participate in the characterization of commercial polymers. Prof. Stepto requested that “Characterization” be dropped from the name of the subcommittee.

- 16.3. Prof. Stepto asked whether the Modeling of Polymerization Kinetics and Processes task group wishes to become a subcommittee? Prof. Buback responded that it did and the Division unanimously approved. As with the Commercial Polymers Subcommittee, there will be two co-chairmen, Profs. Buback and Hutchinson, and one secretary, Prof. Beuermann.
- 16.4. A question was raised as to whether the Division should have an Education Subcommittee. Prof. Sanderson responded that he thinks that we should handle that as a feasibility project and propose a structure and people at the 2004 meeting.
- 16.5. Prof. Stepto noted that these subcommittees will start on 1 January 2004 and must be renewed at the next General Assembly. The chairmen need to provide an updated list of members to him by 30 October 2003.

## **17. Name of the Division (Stepto)**

- 17.1. Prof. Stepto opened a discussion on the name of the Division. Should it be named the Polymer Division rather than the Macromolecular Division? The change could be justified on the basis that the Division’s work centers on substances rather than molecules. He asked for comments from the Division. Prof. Kratochvíl strongly objected because it could possibly cause confusion. Prof. Jenkins commented that it is questionable about whether it would do more harm than good. Prof. Penczek suggested that the Division look at the titles of journals; almost all use “polymer” in the title. Prof. Jenkins noted that both polymer and macromolecule have had to appear in documents and suggested that we consider renaming the Division as the “Macromolecular and Polymer Division.” Prof. Stepto requested the opinion of the observers at the meeting. Dr. Saunders responded that he thought “polymer” was more appropriate. Prof. Buback suggested that “polymer” is more appropriate as it better reflects what the Structure-Property and Kinetics subcommittees do. Prof. Horie proposed his preference for “macromolecular” because that embraces biomacromolecules. Prof. Jones suggested that the broadest term be used, therefore, he favored “polymer.” Prof. Stepto proposed a “straw-vote” on the different proposals:

<u>Name</u>	<u>Votes</u>
Macromolecular Division	8
Polymer Division	17
Macromolecular and Polymer Division	2
Polymer and Macromolecular Division	0

Prof. Jin suggested that more time was needed to think about the change and suggested that the decision be postponed. Prof. Kratochvíl moved that the decision be postponed for a year and Prof. Jenkins seconded the motion. A vote resulted in favor of

postponement by 20-10. Prof. Mormann suggested that the discussion in 2004 be early on the agenda to allow sufficient discussion.

## **18. Vice-President's Topics (Jin)**

18.1. Prof. Jin reported that he had nothing in particular to bring up. He wanted to convene a meeting while we were in Ottawa to discuss how to use the Samsung fund.

18.1.1. The Sub-Division meeting to discuss the Samsung award procedures established that in years when a World Polymer Congress is held, there would be several prizes awarded, which would be called the IUPAC Congress Prizes and would have several sponsors listed (possibly including Samsung). There would also be one prize for young scientist that would use the investment earnings from the Samsung award; the name of the prize was proposed to be the Samsung IUPAC Prize. Prof. Jin will discuss with Samsung representatives to determine whether this is acceptable. In years when there is a General Assembly, an award named the IUPAC Samsung Award for Education will be given to support an educational project. It was agreed that the Executive Committee of the Division would decide on the recipients of these awards.

## **19. Division Elections (Stepto, Work, Jin)**

19.1. Division elections were held by e-mail for the first round. Second round votes at the Division meeting were held whenever no candidate for a position received more than 50% of the vote. The results were as follows:

### **Titular Members**

Division Secretary:

W. J. Work

Coordinators for Characterization Subcommittees:

M. Buback

S. C. Kim

Coordinator for Developing Polymer Materials Systems:

C. Ober

Coordinator for Education

R. D. Sanderson

### **Associate Members**

Chairman of the Sub-Committee on Macromolecular Terminology:

M. Hess

Coordinators for Characterization Subcommittees:

R. S. Bailey

H. Pasch

Coordinator for Developing Polymer Materials Systems:

J. Vohlídal

Coordinator for Education

J.-P. Vairon

Coordinator for Conference Sponsorship, Recruitment & Publicity:

S. Penczek

19.2. A number of nominees for National Representatives to the Division have been received, including three nominees from India. These were:

Tenhu (Finland)

Pascault (France)

Costa (Italy)

Schopov (Bulgaria)

Nystrom (Sweden)

Girokaynak (Turkey)

Chang (Korea)

Because the Division has elected members from France and Korea, a special case will have to be made for Profs. Pascault and Chang to be National Representatives. Six National Representatives are allowed. Those listed will be accepted upon approval of the exceptions for Pascault and Chang and approval for one additional National Representative. A letter will be written to the Indian National Adhering Organization to request that they select one scientist as a national representative, as required by IUPAC rules.

**N.B. The final membership of the Division IV Committee for the biennium 2002-3, following the Bureau and Council meetings and subsequent correspondence is attached to these minutes.**

**20. Date of Next Meeting.**

20.1. The Division will meet next year on pm, Friday, July 2, 2004 and am Saturday, 3 July 2004 in Paris, just before the World Polymer Congress. The Terminology Subcommittee will meet from 28 June until 1 July in Bordeaux, the Structure-Properties Subcommittee will meet from 1-2 July in Paris, and the Kinetics Subcommittee will meet on 4 July in Paris.

William J. Work

## IUPAC MAROMOLECULAR DIVISION (IV)

### Report to Council for 2001 - 2003

#### I. Highlights and Executive Summary

.. Following the IUPAC restructuring, the Division took the **opportunity to reorganise** so that the Associate and Titular Members all have defined, co-ordinating roles to play. This approach has functioned well and all areas of activity are moving forward with vigour.

.. The **areas of activity** of the Division and the associated co-ordinators are:

**Structure - Property Characterization of Commercial Polymers** (Co-ordinator H.M. Laun)

**Molecular Characterization of Polymers** (Co-ordinator D. Berek)

**Polymerization Kinetics Characterization** (Co-ordinator M. Buback)

**Subcommittee on Macromolecular Terminology** (Co-ordinators M. Hess (Chairman) and M. Barón (Secretary))

**Developing Polymer Materials Systems** (Co-ordinators J. Vohlídal and W.J. Work)

**Education** (Co-ordinators J.-Il Jin, A.R. Khokhlov, D. Tabak)

**Conference Sponsorship** (Co-ordinators P. Kubisa and S. Penczek)

**Recruitment at Conferences** (Co-ordinator R.G. Gilbert)

**Electronic Publications and Communications** (Co-ordinators R.G. Jones and W.J. Work)

**Division Strategy** (Co-ordinators K. Horie, J.-Il Jin, Wang Fosong)

(The first five areas, Structure-Property Characterisation of Commercial Polymers to Developing Polymer Materials Systems closely reflect previous activities under the commissioned-based structure.)

A summary of the activities under the various areas according to the six goals of the current IUPAC Strategic Plan are given in Section II. More details are given in Section III and collected data (projects, conferences and publications) are listed in Section IV. Key points in terms of achievements and developments are given in this section.

.. The **Division web site** has been changed so that the new structure and activities can clearly be seen. The Division is also actively pursuing a policy of having all its reports and recommendations available on the web site.



- .. The Division's work on the **Structure - Property Characterization of Commercial Polymers** continues to make a significant input in this vital industrial (and academic) area. The activity is the continuation and expansion of the work of Working Party IV.2.1. It represents an enormous effort, involving 82 task group members from industry and academia in 19 countries, and a sizeable industrial investment in terms of facilities and manpower. The Division sees the work as a flagship activity
- .. The projects under the **Molecular Characterization of Polymers**, involving about 30 task group members, are beginning to result in publications. The work is presently based on evaluating and developing size-exclusion chromatography methods. The Division will be seeking to broaden the investigations to include other methods.
- .. The projects in the area of **Polymerization Kinetics Characterization** relate to the modelling and critical evaluation of rate coefficients of free-radical polymerizations of industrial relevance. About 40 task group members are involved and the resulting publications are highly valued in the field, as witnessed by the very high numbers of citations they receive.
- .. The formation of the **Subcommittee on Macromolecular Terminology** at Brisbane proved to be the right course of action to enable the momentum and range of activities of Commission IV.1 to continue. The Division saw it as important that the Subcommittee was formed in order that macromolecular terminology and nomenclature could continue to be developed in a collective fashion, both by round-table discussion and by email correspondence. The Subcommittee has 28 members and about 25 additional, active task-group members. It is presently bringing projects existing under Commission IV.1 to successful conclusions and launching feasibility studies for new projects. In addition, it collaborates actively with Division VIII on nomenclature projects, with the Chairman of the Subcommittee being a Titular Member of Division VIII.
- .. Following the successful operation of the Subcommittee on Macromolecular Terminology, the Division plans to launch **new Subcommittees** appropriate to other areas of activity. Thus, a **Subcommittee on the Structure - Property Characterization of Commercial Polymers** and a **Subcommittee on the Modelling of Polymerization Kinetics and Processes** will be launched during the General Assembly in Ottawa. Discussions are also taking place on whether to form Subcommittees on Molecular Characterization and Education.
- .. The area of activity **Developing Polymer Materials Systems** is a broadening of the remit of Commission IV.3 on Functional Polymers. It is a valuable area of work but it is still a relatively small effort with about 10 task group members involved in projects on conducting polymer materials. Plans to launch a major activity related to polymers linked with biomaterials are under discussion.
- .. The Division sees **Education** (in Polymer Science), particularly of young people and for those from educationally hindered countries, as an important activity. About 15 active task-group members are involved. During the biennium, the Division will have partially sponsored and supported **eight** educational courses and workshops and it has been grateful

for the financial support received from COCI for one of the courses. In addition, there is increased cooperation with CCE and the significant participation of polymer scientists in their next conference in Istanbul in 2004 is planned.

- .. Linked with its work in **Education**, the Division is pleased to announce a \$125,000 endowment from the **Samsung General Chemicals Company of South Korea**. The interest from the endowment will be used for awards, prizes and bursaries for educational courses and young scientists. Jung-II Jin, the Vice-President of the Division, was instrumental in obtaining the endowment.

- .. As with Education, the Division has taken a particular initiative regarding **Conference Sponsorship**. Largely through the efforts of the Co-ordinators for Conference Sponsorship and other Division Members, a total of 21 IUPAC-sponsored polymer conferences have been and will be held in 2002 and 2003. Every effort is being made to maintain this level during the coming biennium.

Eight conference volumes have resulted in 2002 and 2003 from this increased activity (see publications [1-8]). More than half of the issues of Macromolecular Symposia are presently devoted to IUPAC-sponsored conferences, representing a significant income to IUPAC. This year, for the first time, the journal was unable to accommodate all the IUPAC conferences it was offered.

The IUPAC World Polymer Congress of 2002, organised through the Division, was held in Beijing. It is generally recognised that the biennial IUPAC World Polymer Congress, with over 1000 participants, is the main event in the international polymer conference calendar.

- .. Active steps are being taken in **Recruitment at Conferences**. A Division Brochure has been prepared and is distributed at all IUPAC-sponsored conferences. In addition, the Powerpoint presentations issued by the Secretariat have been augmented to emphasise Macromolecular Division activities. Electronic versions of the brochure and the presentations are given to all conference organisers and IUPAC representatives.

- .. The consideration of **Polymer World and Division Strategies** has been a new initiative of the present biennium. Polymer Science and Technology is no longer based primarily on the macromolecule but it is central to many modern functional and structural materials. The Division's aims and activities need to change continually and to grow in order to reflect the new emphasis and increasing diversity. The Division helped to organise a very successful **Strategic Polymer Conference** in Kyoto in December 2002 and a second is planned for New York in 2005. It has also launched a strategic study of future developments in polymer science.

- .. **Future Plans and Structure**

Division IV will seek to form more subcommittees covering its project areas in order to give a more visible and coherent structure to its activities.

The Division proposes to maintain its existing project areas, Structure-Property Characterization, Molecular Characterization, Polymerization Characterization, Terminology, Developing Polymer Materials Systems and Education and also its efforts in

Conference Sponsorship. It will seek to expand its profiles in Molecular Characterization and Developing Polymer Materials Systems and maintain its high level of activity and throughput in all project areas and in Conference Sponsorship. The Division will seek to play a strategic role in defining the important areas of world polymer research through its strategic study and conferences.

In order to give continuity to the Division's structure and range of activities, it is intended, for the first time, that the coming elections to the Division Committee will be to positions designated for particular responsibilities.

## **II. Division Activities and the IUPAC Strategic Plan**

### **(a) World Leadership**

The Division has launched **Strategic Study** into the needs and direction of World Polymer Science (project 2002-057-1-400) and has helped to organise the first **Strategic Conference**, in Kyoto, December 2002, on the Mission and Challenges of Polymer Science and Technology. A keynote article of the same title as the conference is in press in Pure and Applied Chemistry (publication [9]). A second strategic conference is planned for June 2005 in New York.

The **IUPAC World Polymer Congresses** organised biennially under the auspices of Division IV are the largest and the most important conferences in the international polymer conference calendar. The WPC in 2002 took place in Beijing, that in 2004 will take place in Paris and in 2006 the WPC will be in Rio de Janeiro.

### **(b) Advancement of Research through International Standardisation and Scientific Discussion**

The Division is active in several areas under this heading, as witnessed by its work on the Structure - Property Characterization of Commercial Polymers, the Molecular Characterization of Polymers, Polymerization Kinetics Characterisation and Developing Polymer Materials Systems, as well as the work of the Subcommittee on Macromolecular Terminology. Overall, 7 new projects have been launched and 17 other projects are active or have been running during 2001-2003. 36 reports and papers have been published or are in press (publications [10-45]). In addition, 12 meetings of task groups or collected task groups and 2 meetings of the Subcommittee on Macromolecular Terminology have been held.

### **(c) Assistance to Chemistry-Related Industry**

**The Division's work in the four areas of Structure - Property Characterization of Commercial Polymers, Molecular Characterization of Polymers, Polymerization Kinetics Characterisation and Developing Polymer Materials Systems is directly related to the needs of chemistry-related industry. Of the detailed figures given under (b), this work accounts for 5 of the new projects, 6 of the active projects, 30 of the publications and the 12 meetings of task groups or collected task groups.**

### **(d) Fostering Communication between Individual Chemists and Scientific Organisations**

The **strategic study and strategic conferences** described under (a) are definite attempts to foster communication between individual chemists and scientific organisations.

The **Polymer Summit** meetings, organised in conjunction with World Polymer Congresses bring together representatives from Chemical and Polymer Societies from across the world and foster scientific discussion and the exchange of ideas. A booklet giving details of all World Polymer Organisations is prepared for Polymer Summit meetings by the Society of Polymer Science, Japan under the auspices of Division IV.

The **21 conferences sponsored** in 2002-2003 and the **8 volumes of conference papers** published so far [1-8] in the same period represent attempts to foster communication between individual chemists.

The **8 educational courses and workshops** partially sponsored and supported by the Division have been aimed specifically at young chemical scientists from educationally hindered countries.

**(e) Enhancement of Chemistry Education, Development of Young Scientists and Public Appreciation of Chemistry**

As just stated under (d), the 8 educational courses and workshops partially sponsored and supported by the Division are aimed at young chemical scientists from educationally hindered countries. They account for 1 new project, 1 planned new project and 4 active projects in the period 2001-2003.

Students on one of the courses, a postgraduate course based in Prague, have published 13 papers in journals (publications [46-58]). Other courses and workshops have led to material being issued as booklets and the IUPAC project on University Education in Polymer Science (based in Moscow) has led to the electronic publication of educational material, some of which will appear on the Division web site.

**(f) Breadth of National Membership**

Scientists involved with Division IV are spread worldwide. For example, the Division Committee has members from 19 countries, the Subcommittee on Macromolecular Terminology 17 countries, the Task Groups on Structure - Property Characterization of Commercial Polymers 19 countries and those on Polymerization Kinetics Characterisation have members from 10 countries.

### **III. Summary for 2001-2003 of Level of Work and Outputs in the Division's Various Areas of Activities**

(The detailed lists of projects, sponsored conferences and publications are given in Section IV.)

#### **Structure - Property Characterization of Commercial Polymers** (Co-ordinator H.M. Laun):

(The work in this area was formerly under the auspices of Working party IV.2.1. On the change to a project-driven system, the Working Party made a particular effort to complete all its outstanding projects.)

- 11 completed projects
- 2 continuing projects
- 2 new projects
- 5 feasibility studies for new projects
- 6 meetings of collected tasks groups (Karlsruhe, Naha (Japan), London (Canada), Beijing, Ludwigshafen, Stonefield Castle (Scotland))
- 24 reports and papers published, in press, submitted or prepared for publication [10-33]

In addition, a comprehensive summary of work in this area entitled "Working Party IV.2.1 'Structure and Properties of Commercial Polymers' – History, Output and Future Prospects has been prepared and is under review by the Division.

#### **Molecular Characterization of Polymers** (Co-ordinator D. Berek):

(The work in this area was formerly under the auspices of Working Party IV.2.2.)

- 1 project completed
- 1 project continuing
- 1 feasibility study for a new project
- 2 meetings of collected task groups (Bratislava, Leoben (Austria))
- 2 reports and papers published or in press [34,35]

#### **Polymerization Kinetics Characterization** (Co-ordinator M. Buback):

(The work in this area was formerly under the auspices of Working Party IV.2.8.)

- 1 project completed
- 1 project continuing
- 2 new projects
- 4 meetings of task groups (Il Ciocco (Italy), Boston (USA) (twice), Quebec City)
- 3 reports and papers published or in press [36-38]

**Subcommittee on Macromolecular Terminology** (Chairman M. Hess, Secretary M. Barón)  
(The work in this area was formerly under the auspices of Commission IV.1.)

- 5 projects completed
- 6 continuing projects
- 4 projects transferred to Division VIII as joint projects
- 2 new projects
- 4 feasibility studies for new projects
- 2 Subcommittee Meetings (Beijing, Ottawa)
- 6 recommendations published or in press [39-44]
- 1 recommendation under ICTNS and public review

**Developing Polymer Materials Systems** (Co-ordinators: J. Vohlidal and W.J. Work)  
(This area of work is an expansion of that formerly carried out under the auspices of Commission IV.3 on Functional Polymers.)

- 1 project completed (on conducting polymer colloids)
- 1 new project launched (conducting polymer colloids)
- 1 feasibility study for new projects in the areas of biopolymer materials and biodegradability.
- 1 report published [45]

**Education** (Co-ordinators J.-Il Jin, A.R. Khokhlov and D. Tabak)

- 1 UNESCO/IUPAC postgraduate course (Prague) completed (project)
- 1 project on University Education in Polymer Science (Moscow) completed
- 2 characterisation courses (Denton (USA)) completed (projects)
- 1 UNESCO/IUPAC course (Stellenbosch (RSA)) completed
- 1 new UNESCO/IUPAC postgraduate course (Prague) (project)
- 1 new characterisation course (Minho) planned (project)
- 1 new joint UNESCO/IUPAC course (Stellenbosch (RSA)) planned

All the courses have led to the publication and distribution of educational materials. In the postgraduate course, published papers have been an outcome (see publications [46-58]). The project based in Moscow will lead to educational material being posted on web sites, including the IUPAC web site.

**Conference Sponsorship** (Co-ordinators P. Kubisa and S. Penczek):

The Division has been active in seeking out conferences for IUPAC sponsorship and, in this initiative, the help of the Secretariat in reducing the lead time for obtaining sponsorship is much appreciated. The following figures summarise the results of its activities (see Section IV for details of the conferences):

- 11 conferences sponsored in 2002 ( 9 in 2001 and 6 in 2000)
- 10 conferences are sponsored to date for 2003
- 4 conferences are sponsored so far for 2004 and 1 conference for 2005

≈ 100% of the sponsored conferences result in journal or book publications of conference proceedings (publications [1-8])

≈ 50% of the volumes of Macromolecular Symposia are proceedings from IUPAC sponsored conferences approved through Division IV

**Polymer and Division Strategy (Co-ordinators K. Horie, J.-Il Jin, Wang Fosong)**

The Polymer Summit is held biennially as part of World Polymer Congresses, and brings together representatives from Polymer Societies worldwide to discuss matters of strategic importance and future initiatives. A meeting was held in Beijing, in 2002, as part the World Polymer Congress there and the next will be held in Paris in 2004.

To maintain a sense of world polymer community, a database and booklet of World Polymer Organizations is compiled, in conjunction with the Division, by The Society of Polymer Science, Japan. A new booklet was published in July, 2002.

The first IUPAC Strategic Conference on the Mission and Challenges of Polymer Science and Technology was held in December 2002 in Kyoto. The next will be held in New York in 2005.

A new project on the strategic study of world polymer science has been launched.

R.F.T. Stepto  
Manchester  
June, 2003



## **IV. Collected Data**

### **Projects**

#### **Structure –Property Characterization of Commercial Polymers**

##### **Completed Projects**

421/15/86 Melt Rheology and Concomitant Morphology in Polyblends and Polyalloys  
Task Group Leader: A.P. Plochocki

421/20/87 Characterisation of flow behaviour and properties of Liquid Crystal and Aromatic Polymers  
Task Group Leader: J. White

421/28/89 Structure-Property Relationship of Discontinuous Fibre Reinforced Plastics  
Task Group Leaders: M. Bevis, A. Cervenka, and W. Gleissle

421/29/91 Rubber Toughening of Plastics  
Task Group Leaders: C.B. Bucknall and M. Kozlowski  
Completion Date: 2001

421/30/93  
The Influence of Reprocessing on the Structure-Property Characteristics of a Plasticised PVC Compound  
Task Group Leaders: D. R. Moore and C. Dehennau

421/31/93  
Structure and Properties of Hydrogenated NBR  
Task Group Leaders: T. Kobatake and T. Masuda

421/32/95  
Future Requirements in the Characterisation of Continuous Fibre Reinforced Polymeric Composites  
Task Group Leaders: D.R. Moore and A. Cervenka

421/33/95  
Rheological and Mechanical Properties of P $\alpha$ MSAN/PMMA Blends in Miscible and Phase Separated Regimes of Various Morphologies  
Task Group Leaders: H.M. Laun, L. Lyngaae-Jørgensen and V. Altstädt

421/34/95  
Property Improvement via Interfacial Chemical Reaction - Reactive Extrusion of EVOH/SMA and Polyamide/MAH-EPR  
Task Group Leaders: J.E. Curry, J.G. Bonner, and P.S. Hope

421/35/97

Effects of Side-Chain Branching on Processability of Commercial Polycarbonates

Task Group Leaders: M. Takahashi, K. Sato, T. Masuda

421/36/97

Studies on Biodegradable Poly( $\epsilon$ -caprolactone).

Task Group Leaders: M. Hirami, M. Mochizuki, T. Hayashi

### **Continuing Projects**

1999-020-1-400

Quantifying scratch resistance of commercial polymers

Task Group Leader: R. Bailey

1999-039-1-400

Structure and Properties of Cyclic Olefin Copolymers

Task Group Leader: S.C. Kim

### **New Projects**

2002-052-1-400

Structure and Properties of polyester elastomers composed of poly(butylenes terephthalate) and poly( $\epsilon$ -caprolactone)

Task Group Leader: T. Takigawa

2003-009-1-400

Recommendations for data presentation, applicable to mechanical and rheological measurements of polymers.

Task Group Leader: E. Wassner

## **Molecular Characterization of Polymers**

### **Completed Project**

422/6/98

Characterization of Polyamides using Size Exclusion Chromatography

Task group Leader: E.C. Robert

### **Continuing Project**

1999-021-1-400

Round-Robin Test on the Molecular Characterization of Epoxy Resins by Liquid Chromatography

Task group Leader: S. Podzimek

## **Polymerization Kinetics Characterization**

### **Completed Project**

2000-001-1-400

Critically Evaluated Propagation Rate Coefficients for Free-Radical Polymerizations of Methacrylic Acid Esters with Functional, Cyclic and Branched Ester Groups

Task group Leader: S. Beuermann

### **Continuing Project**

2000-028-1-400

Critically Evaluated termination Rate Coefficients for Free-Radical Polymerization

Task Group Leader: G.T. Russell

### **New Projects**

2002-023-1-400

Critically Evaluated Propagation Rate Coefficients for Free-Radical Polymerizations: Acrylic Acid Akyl Esters

Task Group Leader: R. Hutchinson

2002-053-1-400

Establishment of Quantitative Reliability of Electron Spin Resonance Techniques for Polymerization Kinetics

Task group Leader: B. Yamada

## **Macromolecular Terminology and Nomenclature**

### **Completed Projects**

410/18/87

Definition of Basic Terms Relating to Low-Molar-Mass and Polymer Liquid-Crystals

Task Group Leaders: M. Barón and R.F.T. Stepto

410/19/89

Revision of Nomenclature for Regular Single-Strand Organic Polymers

Task Group Leader: J. Kahovec

410/21/93

Generic Source-Based Nomenclature for Polymers

Task Group Leaders: E. Maréchal and I. Mita

410/24/93

Terminology Related to Polymer Composites and Blends

Task Group Leaders: K. Horie and W.J. Work

410/25/93

Definition of Terms Relating to Stereochemically Assymmetric Polymerizations

Task Group Leaders: T. Kitayama and K. Hatada

### **Continuing Projects**

1999-048-1-400

Definition of Terms Relating to Reactions of Polymers and Functional Polymers

Task Group Leader: K. Horie

2000-006-1-400

Terminology of Polymers Containing Ionizable Groups and Polymers Containing Ions

Task Group Leader: P. Kubisa

2000-007-1-400

Glossary of Terms Relating to Polymeric Gels and Networks, Hybrid Inorganic Polymer Materials and the Processing thereof

Task Group Leader: R.G. Jones

2000-014-1-400

Glossary of Class Names of Polymers Based on their Chemical Structure and Molecular Architecture

Task Group Leader: J. Vohlidal

2000-016-1-400

Terminology for the Kinetics, Thermodynamics and Mechanisms of Polymerizations

Task Group Leader: S. Penczek

2000-017-1-400

Polymerization Processes and Polymers in Dispersed Systems

Task Group Leader: S. Slomkowski

### **Continuing Joint Division VIII Projects**

1999-051-1-800

Source Based Nomenclature for Modified polymer Molecules

Task Group Leader: E.S. Wilks

2000-037-1-800

Nomenclature for Macromolecular Rotaxanes

Task Group Leader: E.S. Wilks

2000-081-1-800

Terminology and Structure-Based Nomenclature of Dendritic and Hyperbranched Polymers  
Task Group Leader: J. Kahovec

2000-082-1-800

Terminology and Nomenclature of Macromolecules with Cyclic Structures  
Task Group Leader: W. Mormann

### **New Projects**

2002-006-2-400

Terminology for Radical Polymerizations with Minimal Termination – the so-called “Living” and “Controlled” Radical Polymerizations  
Task Group Leaders: A.D. Jenkins, R.G. Gilbert and G. Moad

2003-021-1-400

Definitions of Terms Relating to Crystalline Polymers  
Task Group Leader: G. Allegra

### **Developing Polymer Materials Systems**

#### **Completed Project**

1999-024-1-400

Polyaniline: the Preparation of a Conducting Polymer  
Task Group Leader: J. Stejskal

#### **New Project**

2002-019-1-400

Conducting Polymer Colloids and Nanofilms  
Task Group Leader: J. Stejskal

### **Education**

#### **Completed Projects**

1999-029-1-400

UNESCO/IUPAC Postgraduate Course in Polymer Science  
Task Group Leader: P. Kratochvíl

2000-005-1-400

University Education in Polymer Science  
Task Group Leader: A.R. Khokhlov

2001-065-1-400  
10<sup>th</sup> Annual Course on Polymer Characterization  
Task Group Leader: W. Brostow

2002-027-1-400  
11<sup>th</sup> Annual Course on Polymer Characterization  
Task Group Leader: W. Brostow

**New Project**

2002-047-1-400  
UNESCO/IUPAC Postgraduate Course in Polymer Science  
Task Group Leader: P. Kratochvíl

**Strategy**

**New Project**

2002-057-1-400  
Strategic Study of World Polymer Science  
Task Group Leader: M. Sawamoto

## **Conferences Sponsored**

### **2002**

10th International Conference on Polymer Characterization (POLYCHAR-10), Denton, Texas, USA, January 7-11

5th Annual South African UNESCO School/IUPAC Conference on Macromolecules and Materials Science, Stellenbosch, South Africa, March 23-28

4th International Symposium on Molecular Order and Mobility in Polymer Systems, St. Petersburg, Russia, June 3-7

7th World Conference on Biodegradable Polymers and Plastics, Tirrenia (Pisa), Italy, June 4-8

World Polymer Congress 2002 - 39th IUPAC International Symposium On Macromolecules, Beijing, China, July 7-12

Polymers and Organic Chemistry 2002, San Diego, CA, USA, July 14-18

21st Discussion Conference: Electronically Active Polymers, Prague, Czech Rep., July 15-18

Macro Group UK International Conference on Polymer Synthesis, Coventry, UK, July 29 - August 1

Polymer Networks 2002, Autrans, France, September 2-6

Macromolecules in the 21st Century, Vienna, Austria, October 7-9

IUPAC Polymer Conference on the Mission and Challenges of Polymer Science and Technology, Kyoto, Japan, December 2-5

### **2003**

11th International Conference on Polymer Characterization (POLYCHAR-11), Denton, Texas, USA, January 6-10, 2003

6th Annual UNESCO School/IUPAC Conference on Polymer Properties, Mpumalanga, South Africa, April 14-17, 2003

Xth International Symposium on Macromolecule Metal Complexes (MMC-X), Moscow, Russia, May 20-24, 2003

International Symposium on Ionic Polymerization, Boston, USA, June 30 - July 4, 2003

Degradation, Stabilization, and Recycling of Polymers, Prague, Czech Republic, July 14-17, 2003

Spectroscopy of Partially Ordered Macromolecular Systems, Prague, Czech Republic, July 21-24, 2003

17<sup>th</sup> Bratislava International Conference on Macromolecules. Molecular Characterization of Polymers, Bratislava, Slovakia, August 24-28, 2003

Interfaces and Interphases in Multicomponent Materials, Balatonfüred, Hungary, Oct 5-8, 2003

1st International Conference on Bio-based Polymers (ICBP 2003), Saitama, Japan, Nov 12-14, 2003

8th Pacific Polymer Conference, Bangkok, Thailand, Nov 24-27, 2003

## **2004**

12<sup>th</sup> Annual Polychar World Forum on Advanced Materials, Guimaraes, Portugal, Jan. 5-9, 2004

43<sup>rd</sup> PMM Microsymposium: Polymer Biomaterials; Biomimetic and Bioanalogous Systems, Prague, Czech Republic, July 12-15, 2004

11<sup>th</sup> International Conference on Polymers and Organic Chemistry, Prague, Czech Republic, July 18-23, 2004

18<sup>th</sup> International Conference on Chemical Education, Istanbul, Turkey, August 3-8, 2004

## **2005**

Polymer Conference on the Mission & Challenges of Polymer Science and Technology, New York, June, 2005



## **Publications**

### **Conference Publications**

1. 15<sup>th</sup> Bratislava International Conference on Polymers, Bratislava, Non-Conventional Polymer Dispersions, Slovakia, 2001  
*ed. I. Capek*  
Macromol. Symp. **179**, 1-358 (2002)
2. 3<sup>rd</sup> IUPAC International Conference on Free-Radical Polymerization. Kinetics and Mechanism, Lucca, Italy, June 2001  
*eds. M. Buback and A. L. German*  
Macromol. Symp. **182**, 1-303 (2002)
3. IUPAC International Symposium on Ionic Polymerization, Crete, Greece, July 2001  
*eds. N. Hadjichristidis and H. Iatrou*  
Macromol. Symp. **183**, 1-210 (2001)
4. 8<sup>th</sup> IUPAC International Symposium on Macromolecule-Metal Complexes (MMC-9), New York, August 2001  
*eds. K. Levon and A. Guiseppi –Elie*  
Macromol. Symp. **186**, 1-185 (2002)
5. 41<sup>st</sup> Microsymposium of the Prague Meetings on Macromolecules, Polymer Membranes, July 2001  
*ed. J. Kahovec*  
Macromol. Symp. **188**, 1-164 (2002)
6. 6<sup>th</sup> Brazilian Polymer Conference, Polymer Science Insights, Gramado, Brasil, November 2001  
*ed. M. A. De Paoli*  
Macromol. Symp. **189**, 1-141 (2002)
7. 20<sup>th</sup> Discussion Conference of the Prague Meetings on Macromolecules, Scattering Methods for the Investigations of Polymers, Prague, July 2001  
*ed. J. Kahovec*  
Macromol. Symp. **190**, 1-199 (2002)
8. 5<sup>th</sup> Annual School and IUPAC Conference on Macromolecules and Material Science, Stellenbosch, South Africa, March 2002  
*eds. H. Pasch, R. D. Sanderson*  
Macromol. Symp. **193**, 1-304 (2003)

## Strategy

9. The Missions and Challenges of Polymer Science and Technology  
*R.F.T. Stepto, K. Horie, T. Kitayama and A. Abe*  
Pure and Applied Chemistry 2003, *in press*

## Structure –Property Characterization of Commercial Polymers

10. Melt rheology and concomitant morphology of a model binary mixture of polyethylene and polystyrene (polyblend)  
*A.P. Plochocki*  
Pure and Applied Chemistry, *manuscript prepared 2003*  
(Project 421/15/86)
11. The rheological properties and associated structural characteristics of some aromatic polycondensates including liquid crystalline polyesters and cellulose derivatives  
*J. L. S. White, L. Dong and P. Han*  
Pure and Applied Chemistry, *submitted 2001*  
(Project 421/20/87)
12. Characterisation of finite length fibre composites: Part VII. Rheological studies of processed polypropylene-glass composites  
*W. Gleissle*  
Polymer Engg. Sci. **18**, 20-32 (2003)  
(Project 421/28/89)
13. Blends Containing Core-Shell Impact Modifiers. Part 1: Structure and Tensile Deformation Mechanisms  
*C. B. Bucknall*  
Pure and Applied Chemistry **73**, 897-912 (2001)  
(Project 421/29/91)
14. Blends Containing Core-Shell Impact Modifiers. Part 2: Melt Rheology of Rubber-Toughened Plastics  
*M. Kozłowski and C. B. Bucknall*  
Pure and Applied Chemistry **73**, 913-926 (2001)  
(Project 421/29/91)
15. Blends Containing Core-Shell Impact Modifiers. Part 3: Effects of temperature on tensile impact behaviour  
*C. B. Bucknall and G. Ajroldi*  
Plastics Rubber & Composites **30**, 377-383 (2001)  
(Project 421/29/91)

16. Blends Containing Core-Shell Impact Modifiers. Part 4: Fatigue behaviour  
*C. B. Bucknall*  
Plastics Rubber & Composites, *manuscript prepared 2003*  
(Project 421/29/91)
17. Blends Containing Core-Shell Impact Modifiers. Part 5: Fracture in dart-drop and notched bending tests  
*C. B. Bucknall*  
Plastics Rubber & Composites, *manuscript prepared 2003*  
(Project 421/29/91)
18. Structure and Properties of Hydrogenated Acrylonitrile-Butadiene Rubber (HNBR). Part I. Relation between Viscosity and Intermolecular Interaction in Dilute Solution States  
*T. Kobatake, A. Yoshioka, K. Nakayama, J. He, Y. Aoki, T. Masuda*  
Pure and Applied Chemistry, *manuscript prepared 2002*  
(Project # 421/31/93)
19. Structure and Properties of Hydrogenated Acrylonitrile-Butadiene Rubber (HNBR). Part II. Relation between Viscosity and Intermolecular Interaction in Condensed States  
*T. Kobatake, A. Yoshioka, K. Nakayama, J. He, Y. Aoki, T. Masuda*  
Pure and Applied Chemistry, *manuscript prepared 2002*  
(Project 421/31/93)
20. Future Requirements in the Characterisation of Continuous Fibre Reinforced Polymeric Composites  
*D. R. Moore and A. Cervenka*  
Pure and Applied Chemistry **74**, 601-628 (2002)  
(Project 421/32/95)
21. Rheology and morphology of phase-separating polymer blends  
*Z.I. Zhang, H.D. Zhang, Y.L. Yang, I. Vinckier and H.M. Laun*  
Macromolecules **34**, 1416-1429 (2001)  
(Project 421/33/95)
22. Compatibility of poly( $\alpha$ -methylstyrene-co-acrylonitrile) with PMMA. A neutron and cloud point study  
*D. W. Schubert*  
Mat. Res. Innovat. **4**, 353-359 (2001)  
(Project # 421/33/95)
23. Assessment of the Doi-Ohta theory for co-continuous blends under oscillatory flow  
*I. Vinckier and H.M. Laun*  
J. Rheol. **45**, 1373-1385 (2001)  
(Project 421/33/95)

24. Interfacial tension in a LCST blend: Effect of temperature, blend composition and deformation of the interphase  
*I. Vinckier, T. Schweizer and H. M. Laun*  
J. Polym. Sci. Part B **40**, 679-690 (2002)  
(Project 421/33/95)
25. Consistent analysis of cloud points and spinodal - compatibility of P(aMS -co-AN) and P(MA-co-MMA)  
*F. Havermeier and D. W. Schubert*  
Mat. Res. Innovat. **6**, 185 - 188 (2002)  
(Project 421/33/95)
26. The role of pressure and dissipative heating in capillary rheometry of polymer melts  
*H. M. Laun*  
Rheol. Acta 2002, *in press*  
(Project 421/33/95)
27. Rheological and mechanical properties of poly(a-methylstyrene-co-acrylonitrile)/poly(methylmethacrylate) blends in miscible and phase separated regimes of various morphologies. Part 4. Influence of the morphology on the mechanical properties  
*V. Altstädt, L. de Lucca Freitas and D. W. Schubert*  
Pure and Applied Chemistry, *submitted 2002*  
(Project 421/33/95)
28. Property improvement via interfacial chemical reaction - Reactive extrusion of polyamide 12 and maleic anhydride grafted ethylene propylene copolymer rubber  
*J. E. Curry, P. S. Hope and J. G. Bonner*  
Pure and Applied Chemistry 2001, *in press*  
(Project 421/34/95)
29. Characterisation and rheological properties of three polycarbonates with side-chain branching  
*M. Takahashi, K. Sato, P. Tas, J. He, M. Lecomte and T. Masuda*  
Pure and Applied Chemistry, *manuscript prepared 2002*  
(Project 421/35/97)
30. Processability and mechanical properties of three polycarbonates with side-chain branching  
*M. Takahashi, K. Sakai, K. Sato, J. He, P. Tas and T. Masuda*  
Pure and Applied Chemistry, *manuscript prepared 2002*  
(Project 421/35/97)

31. Studies on biodegradable poly(hexano-6-lactone) fibres. Part 3. Enzymatic degradation in vitro  
*T. Hayashi, K. Nakayama, M. Moshizuki and T. Masuda*  
Pure and Applied Chemistry **74**, 869-880 (2002)  
(Project 421/36/97)
32. Chemical Structure and Physical Properties of Cyclic Olefin Copolymers  
*J. Y. Shin, J. Y. Park, C. Liu, J. He and S. C. Kim*  
Pure and Applied Chemistry, *submitted 2003*  
(Project 1999-039-1-400)
33. Thermal Degradation Studies on Cyclic Olefin Copolymers  
*C. Liu, J. Yu, X. Sun, J. Zhang and J. He*  
J. Polymer Degradation and Stability, *submitted 2003*  
(Project 1999-039-1-400)

### **Molecular Characterization of Polymers**

34. Characterization of Polyamides 6, 11 and 12; Determination of Molecular Weight by Size Exclusion Chromatography  
*E.C. Robert, R. Bruessau, J. Dubois, B. Jacques, N. Meijerink, T.Q. Nguyen, D.E. Niehaus and W.A. Tobisch*  
Pure and Applied Chemistry, *in press*  
(Project 422/6/98)
35. Repeatability and Apparent Reproducibility of Molar Mass Values for Commercial Polymers Determined with Size Exclusion Chromatography  
*D. Berek, R. Bruessau, D. Lilge, I. Mingozi, S. Podzimek, E. Robert*  
Proc. 16<sup>th</sup> International Bratislava Meeting on Polymers, Coupled, Hyphenated and Multidimensional Liquid Chromatographic Procedures for Separation of Macromolecules, Bratislava, September 9 - 13, 2001, p. 57.  
(Project 1999-021-1-400)

### **Polymerization Kinetics Characterization**

36. Critically Evaluated Propagation Rate Coefficients in Free-Radical Polymerizations – III. Methacrylates with Cyclic Ester Groups  
*S. Beuermann*  
Pure and Applied Chemistry, *in press*  
(Project 2000-001-1-400)

37. Critically Evaluated Rate Coefficients for Free-Radical Polymerization 4: Propagation Rate Coefficients for Methacrylates with Cyclic Ester Groups  
*S. Beuermann, M. Buback, T.P. Davis, N. García, R.G. Gilbert, R.A. Hutchinson, A. Kajiwara, M. Kamachi, I. Lacík and G.T. Russell*  
Macromol. Chem. Phys. **204**, 1138-1150 (2003)  
(Project 2000-001-1-400)
38. Critically Evaluated Termination Rate Coefficients for Free-Radical Polymerization  
*M. Buback, M. Egorov, V. Kaminsky, O.F.Olaj, G.T. Russell, P. Vana, G. Zifferer*  
Macromol. Chem. Phys. **203**, 2570-2582 (2002)  
(Project 2000-028-1-400)

### **Macromolecular Terminology and Nomenclature**

39. Definitions of Basic Terms Relating to Low-Molar-Mass and Polymer Liquid Crystals  
*C. Noël, V.P. Shibaev, M. Barón, M. Hess, A.D. Jenkins, Jung-Il Jin, A. Sirigu, R.F.T. Stepto and W.J. Work*  
Pure and Applied Chemistry **73**, 845-895 (2001)  
(Project 410/18/87)
40. Generic Source-Based Nomenclature for Polymers  
*R.E. Bareiss, R.B. Fox, K. Hatada, K. Horie, A.D. Jenkins, J. Kahovec, P. Kubisa, E. Maréchal, I. Meisel, W.V. Metanowski, I. Mita, R.F.T. Stepto and E.S. Wilks*  
Pure and Applied Chemistry **73**, 1511-1519 (2001)  
(Project 410/21/93)
41. Definitions of Basic Terms Relating to Polymer Liquid Crystals  
*C. Noël, V.P. Shibaev, M. Barón, M. Hess, A.D. Jenkins, Jung-Il Jin, A. Sirigu, R.F.T. Stepto and W.J. Work*  
Pure and Applied Chemistry **74**, 493-509 (2002)  
(Project 410/18/87)
42. Definitions Relating to Stereochemically Asymmetric Polymerizations  
*K. Hatada, J. Kahovec, M. Barón, K. Horie, T. Kitayama, P. Kubisa, G.P. Moss, R.F.T. Stepto and E.S. Wilks*  
Pure and Applied Chemistry **74**, 915-922 (2002)  
(Project 410/25/93)
43. Definitions of Terms Related to Polymer Blends, Composites and Multiphase Polymeric Materials  
*W.J. Work, K. Horie, M. Hess and R.F.T. Stepto*  
Pure and Applied Chemistry, *in press*  
(Project 410/24/93)

44. Nomenclature of Regular Single-Strand Organic Polymers

*J. Kahovec, R.B. Fox and K. Hatada*

Pure and Applied Chemistry **74**, 1921-1956 (2002)

(Project 410/19/89)

**Developing Polymer Materials Systems**

45. Polyaniline: the Preparation of a Conducting Polymer

*J. Stejskal and R.G. Gilbert*

Pure and Applied Chemistry **74**, 857-867 (2002) (summary in Chem. Intl. **24**, 26 (2002))

(Project 1999-024-1-400)

**Education** (students names are given in bold type)

46. Modification of poly(styrene-*alt*-maleic anhydride) with 1,3,4-oxadiazole units for electroluminescent devices

*G. Aldea, D. Výprachtický and V. Cimrová*

Macromol. Symp., *in press*

(Project 1999-029-1-400)

47. Non-linear behaviour of PEO during crystallization and melting

*A. Sikora, V.B. Dolgoshey, J. Baldrian and J. Kratochvíl*

Proc. 4<sup>th</sup> Czech-Korean Joint Symposium on Macromolecular Chemistry, Prague 2002, p. 25

(Project 1999-029-1-400)

48. Polyaniline and polypyrrole prepared in the presence of surfactants: A comparative conductivity study

*J. Stejskal, M. Omastová, S. Fedorova, J. Prokeš and M. Trchová*

Polymer **44**, 1353-1358 (2003)

(Project 1999-029-1-400)

49. Surface polymerization of aniline on silica gel

*J. Stejskal, M. Trchová, S. Fedorova, I. Sapurina and J. Zemek*

Langmuir **19**, 3013-3018 (2003)

(Project 1999-029-1-400)

50. Surface and precipitation polymerization of aniline

*S. Fedorova and J. Stejskal*

Langmuir **18**, 5630-5632 (2002)

(Project 1999-029-1-400)

51. Polyaniline nanofilms produced by surface polymerization of aniline  
*S. Fedorova, I. Sapurina and J. Stejskal*  
21st Discussion Conference 'Electrical and Related Properties of Polymers and Other Organic Solids', Prague 2002, Abstracts, P60  
(Project 1999-029-1-400)
52. Influence of properties and morphology of elastomeric phase on the behaviour of ternary reactive blends Nylon 6/rigid polymer/elastomer  
*I. Kelnar, J. Kotek, B.S. Munteanu and I. Fortelný*  
J. Appl. Polymer Sci., *in press*  
(Project 1999-029-1-400)
53. Ternary reactive blend of poly(butylene terephthalate); synergistic effect of finely dispersed rigid polymer and elastomer  
*I. Kelnar, J. Kotek, B.S. Munteanu and I. Fortelný*  
IUPAC World Polymer Congress, 39th International Symposium on Macromolecules, Beijing 2002, Preprints 2, p. 548  
(Project 1999-029-1-400)
54. Effect of reaction parameters on the particle size in the dispersion polymerization of 2-hydroxyethyl and glycidyl methacrylate in the presence of ferrofluid  
*D. Horák, N. Semenyuk and F. Lednický*  
J. Polym. Sci., Part A: Polym. Chem., *in press*  
(Project 1999-029-1-400)
55. The deposition of multilayer proteinaceous coating on PET (in Russian)  
*A. Solovyev, E. Brynda, M. Houska, M. Bleha and L. Shataeva*  
Vysokomol. Soed., *submitted*  
(Project 1999-029-1-400)
56. CocrySTALLIZATION behaviour of low-molecular-weight PEO fractions in polymer blends  
*J. Baldrian, M. Steinhart, A. Sikora, G. Todorova and H. Amenitsch*  
Proc. 4<sup>th</sup> Czech-Korean Joint Symposium on Macromolecular Chemistry, Prague 2002, p. 22  
(Project 1999-029-1-400)
57. Real-time SAXS and DSC study of structure development in crystalline polymer blends  
*J. Baldrian, M. Steinhart, A. Sikora, H. Amenitsch, S. Bernstorff, G. Todorova*  
Proc. 12<sup>th</sup> International Conference on Small-Angle Scattering, Venice 2002, p. 139  
(Project 1999-029-1-400)



58. SAXS and DSC study of cocrystallization of low-molecular PEO fractions in polymer blends

*J. Baldrian, M. Horký, M. Steinhart, A. Sikora, M. Mihailova, H. Amenitsch, S. Bernstorff, **G. Todorova***

Proc. SPIE Int. Soc. Opt. Engg., *accepted*  
(Project 1999-029-1-400)

**IUPAC MACROMOLECULAR DIVISION COMMITTEE**

**Membership 2004 –2005**

**Titular Members**

Prof. R.F.T. Stepto (2002 –2005) President (1998 – 2001 VP)  
Prof. Jung-Il Jin (2002– 2005) Vice-President (1996 – 2001 TM & AM)  
Dr. W.J. Work (1998 – 2007) Secretary  
Prof. Michael Buback (2004 – 2007) (2000 – 2001 TM, 2002 - 2003 AM)  
Prof. Kazuyuki Horie (2002 – 2005)  
Prof. R.G. Jones (2002 – 2005)  
Prof. Sung Chul Kim (2002 – 2007)  
Prof. Przemyslaw Kubisa (2002 – 2005)  
Prof. C.K. Ober (2004 – 2005)  
Prof. R.D. Sanderson (2004 – 2007) (2000 – 2001 AM)

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Prof. Michael Hess (2004 – 2005) (2000 – 2003 TM)  
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S. Ramakrishnan (India)  
G.Costa (Italy)  
G.T. Russell (New Zealand)  
B.Ö.G. Nyström (Norway)  
A.R. Khokhlov (Russia)  
A. Gürkaynak (Turkey)

## **Responsibilities**

<b>Co-ordination Structure &amp; Properties of Commercial Polymers</b>	R.S. Bailey (SSPCP* Co-Chair) S.C. Kim (SSPCP Co-Chair)
<b>Co-ordination Modelling of Polymerisation Kinetics and Processes</b>	M. Buback (SMPKP* Chair)
<b>Co-ordination Molecular Characterisation</b>	H. Pasch
<b>Terminology and Nomenclature Coordination</b>	M. Hess (SMT* Chair, Div. VIII AM) R.G. Jones (SMT Secretary)
<b>Coordination Developing Polymer Materials Systems</b>	C.K. Ober J. Vohlídal W.J. Work
<b>Education Coordination</b>	J.-Il Jin (CCE) R.D. Sanderson J.-P. Vairon
<b>Conference Coordination &amp; Recruitment at Conferences</b>	P. Kubisa S. Penczek
<b>Electronic Communications &amp; Publications</b>	R.G. Jones W.J. Work
<b>Strategy</b>	K. Horie (including Polymer Summit) J.-Il Jin

(\*SSPCP – Sub-Committee on Structure and Properties of Commercial Polymers  
SMPKP – Sub-Committee on Modelling of Polymerization Kinetics and Processes  
SMT – Sub-Committee on Macromolecular Terminology)

## **Representation on other Committees**

<b>CHEMRAWN</b>	J.-Il Jin D. Tabak
<b>COCI</b>	C.K. Ober (to be confirmed)
<b>CCE</b>	J.-Il Jin
<b>ICTNS</b>	J. Kahovec

**Nomenclature Division VIII**

M. Hess  
J. Kahovec

26<sup>th</sup> October 2003

R.F.T. Stepto