

# IUPAC POLYMER DIVISION MEETING

## IUPAC General Assembly

Universita di Torino and the Politecnico di Torino

9.00– 12.30 & 14.00– 17.30, 4 & 5 August 2007

### Minutes

**Those attending:** Dusan Berek (Slovakia), Michael Buback (Germany), Kan-Nan Chen (China), Teh-Chang Chou (China), Dick Dijkstra (Germany), Claudio dos Santos (Brazil), Jiasong He (China), Roger Hiorns (France), Aubrey Jenkins (UK), Jung-Il Jin (Korea), Richard Jones (UK), Joannis Kallitsis (Greece), Sinichiro Kawano (Japan), Sung-Chul Kim (Korea), Tatsuki Kitayama (Japan), Pavel Kratochvil (Czech Republic), Przemyslaw Kubisa (Poland), Zi-Chen Li (China), Der-Jang Liaw (China), Shlomo Margel (Israel), Graeme Moad (Australia), Werner Mormann (Germany), Koh-hei Nitta (Japan), Chris Ober (USA), Harald Pasch (Germany), Stanislaw Penczek (Poland), Elsa Reichmanis (USA), Ryu Chang (USA), Mitsuo Sawamoto (Japan), Francois Schué (France), Jaroslav Stejskal (Czech Republic), Robert Stepto (UK), David Tabak (Brazil), Miroslava Trchova (Czech Republic), Jean-Pierre Vairon (France), Jiri Vohlidal (Czech Republic), William Work (USA)

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

Prof. Jin welcomed the Division members and observers to Torino. He asked for a moment of silence in remembrance of Profs. Kabanov, McDiarmid, and Platé who have passed away during the last year.

#### 2. Apologies for Absence.

Profs. Sanderson and Hodge sent their apologies for their absence. Both were unable to attend due to recent medical problems.

#### 3. Approval of the Minutes of the Division Committee Meeting, Rio de Janeiro, July 2006.

The minutes recording the discussion for the 2006 meeting in Rio de Janeiro were accepted.

#### 4. **Matters Arising.**

Prof. Jin reported that negotiations are nearing completion between the company DSM and IUPAC for the DSM Performance Materials Award. The award will be presented at World Polymer Congresses starting in 2008 and continuing until 2012. It will be presented in conjunction with a ½ day special seminar. The awardee will be selected by a committee with representation from DSM, the Polymer Division, and the Congress organizing committee. There is no age limit on the recipient. A financial award of 50,000 Euros has been proposed for the recipient. It was suggested that the awardee become one of the plenary lecturers. This was considered to be a good idea, but it was noted that it would be desirable to identify the awardee far enough in advance so that the topic could be posted on the Congress website in time to be accessible by Congress attendees. Besides the financial award, DSM will provide financial support for organizing the symposium.

Another development in the last biennium has been a proposal for the Polymer International Award, which has been proposed to be presented at the World Polymer Congress. A \$5000 award plus expenses will be presented by Wiley and be given to a scientist <40 years old. The awardee must attend the World Polymer Congress and agree to present a lecture on the work for which he will receive the award. Prof. Penczek suggested that the organizers of the WPC be asked to hold a plenary lecture position for the awardee and that the individual be selected far enough in advance to allow the name and topic to be printed in the program. Prof. Vairon suggested that the nomination be done strictly on a scientific basis. He noted that this requirement presented some difficulties in 2004 due to pressure from industry. The awardee will be selected by a committee of 5-7 scientists. Another thought was that both a nominating committee and a judging committee should be organized for granting the award.

Prof. Peter Mahaffy, the President of the Committee on Chemical Education (CCD), and Prof. Eva Akesson, the Secretary of the CCE, visited the Division meeting. They described CCE initiatives to develop a web-site to raise public awareness of the uses of chemicals and the importance of chemistry in modern society. As part of these initiatives, they are proposing an international year of chemistry under the umbrella of IUPAC. Another proposal is to develop a program that would fly chemists to locations around the world where their expertise can be made available to support local needs. A conference was held in Mauritius to discuss the outcomes from CCE

initiatives.

Dr. Mark Cesa visited from the Committee on the Chemical Industry (COCI). He noted that this committee is one of three standing committees in IUPAC. The Committee's Terms of Reference include advising the IUPAC President and Executive Committee on the issues that are important to industry. The Committee collaborates with National Adhering Organizations to develop and maintain company associates. It also provides a liaison with associations that represent industry. Projects that are supported by the Committee include efforts to share industrial best practices globally, to transfer knowledge to developing countries, to help build capacity, and to advance the public's appreciation of the contributions of the chemical industry to society. Currently, Prof. Alan Smith has been identified as a representative of COCI to the Polymer Division and Dr. Work represents the Polymer Division in COCI.

**5. Report on Terminology and Nomenclature Projects (Jones, Hess).**

Prof. Jones presented the progress in the Subcommittee on Macromolecular Terminology over the last year. Two documents have been published, Terminology of Polymers with Ionizable Groups and the Japanese Translation of the Purple Book. Three projects are ready for public review: Nomenclature of Cyclic Macromolecules, Terminology Related to the Kinetics of Polymerization, and Polymerization Processes in Dispersed Systems. Three projects are in the final stages of preparation: Nomenclature of Dendritic and Hyperbranched Polymers, Polymer Class Names, and the second edition of the Purple Book. The Purple book has been expanded from nine to 23 chapters and will be about 380 pages. A meeting was held in Prague in May to solve many of the inconsistencies in the Purple book, the final copy is now available for comment; this was provided to several interested attendees for comment by Prof. Jones. In October it will be submitted to Division VIII followed by the ICTNS. Nine projects are in the early stages of development and three joint projects with Division VIII continue. There was no discussion of the subcommittee's report.

**6. Report on Structure— Property Projects (Bailey, Kim).**

Dr. Dijkstra presented the report on the activities of this Subcommittee. The Subcommittee currently involves sixty-eight members from fourteen countries. Membership is balanced between academics and industry (thirty-six from industry and thirty-two from academia). Dr. Dijkstra presented a brief history of the Subcommittee since its founding in 1963, which has been prepared for publication. He attributes its

continued success to the requirement that all members contribute to the preparation of publications. Their project evaluation procedure requires that all proposals be considered for not only for technical feasibility, but also for the probability that a publication will result. Only proposals that pass these criteria are submitted to IUPAC as project proposals by the Subcommittee. The IUPAC website is used as a means of communication among the members working on projects.

Dr. Dijkstra presented the status of the Subcommittee's projects. The Subcommittee has produced five publications in the last two years, most of which are related to polyolefins. A project to evaluate the properties of polyester elastomers (Takigawa) has already resulted in one publication. Rob Bailey's project to quantify the scratch resistance of polycarbonate and poly(methyl methacrylate) has completed its experimental work and will result in one publication. Other projects include processing and mechanical properties of polyamide/ABS blends (Steininger), structure and properties of polymer/clay nanocomposites that will have three publications completed soon, structure and properties of linear and crosslinked PVC foams (Altstadt), the effects of glass beads on the rheological behavior of thermotropic liquid crystalline polymers, the structure and properties of cyclic olefin copolymers (SC Kim), and guidelines for shear rheometer calibration and performance checking (Rullmann), Dr. Rullmann's project will be a two-part project; the first part will promote a standard XML format for presenting rheometer data and the second part will provide guidelines for the rheological characterization of polyamide melts.

Besides the approved projects, the Subcommittee has five feasibility studies: prediction of capillary flow behavior, stress-induced cavitation in the mechanical performance of semi-crystalline polymers, fatigue of soft polymeric materials, mechanism of adhesion to polyolefins, and a round-robin test for elongational film tools for rotational rheometer.

The ensuing discussion addressed several issues after Dr. Dijkstra completed his presentation. Prof. Buback asked how the Subcommittee has managed to achieve such a high level of industrial participation; Dr. Dijkstra responded that they invite prospective industrial members to a meeting separated from any conference. The meeting is focused specifically on the need for industrial support for a project. Prof. Penczek suggested that more of the work from the subcommittee be reported in Chemistry International and e-Polymers. Prof. Stepto noted that IUPAC has not published the history of this subcommittee and suggested that it should be published in

Pure and Applied Chemistry, Chemistry International, and/or e-Polymers.

Prof. Kim reported that Pure and Applied Chemistry did not accept a paper on nanocomposites because it considered the paper to be a research paper despite its origin as an approved IUPAC project. To avoid this occurrence in the future, it was suggested that the Division should have a representative on the editorial board of PAC.

#### **7. Report on Molecular Characterization Projects (Pasch and Chang).**

Prof. Pasch gave the report on this Task Group's activities. He emphasized that the group was not yet a Subcommittee and stated the difficulty of finding molecular characterization projects that are not already covered by the Structure and Characterization Subcommittee. He reported that about thirty scientists have agreed to work to define the group's projects.

A project on data treatment for size exclusion chromatography has been completed by Prof. Meira. It has resulted in four journal publications and numerous presentations; IUPAC approved recommendations are an ongoing activity of this task group.

A project on the terminology for the separation of macromolecules, led by Prof. Chang, will be completed and published in two documents. The first will focus on chromatography and the second on temperature rising elution fractionation (TREF) and field flow fractionation.

A project, led by Prof. Fitzgerald, has been started to establish the terminology and measurement of starch components. Standardizing methodology for size exclusion chromatography and iodine oxidation assays for application to starch characterization are a focus of the project. A problem is that the project cannot be completed on its original schedule (end of 2007) as the samples have only recently been distributed. A technical report and IUPAC recommendations and will be produced.

Prof. Brull leads a project that will look at the efficiency and reproducibility of TREF with the objective to fractionate polyethylene samples. This project is expected to produce IUPAC recommendations and a technical report.

The repeatability and reproducibility of sample preparation and analysis by high temperature SEC is the subject of a project that is currently being lead by Prof. Luruli.

The project has been approved for some time, but there has been a problem with movement of task group chairmen, which has delayed completion. The task group plans to do round-robin tests on standard polyethylene.

Finally, a project on the accuracy and reproducibility of functional group analysis for PEO homopolymers and copolymers by liquid chromatography using critical fluids has been started.

Prof. Penczek asked whether the results of this task group's projects will be presented at the International Symposium on Polymer Analysis and Characterization. Prof. Pasch responded that he was part of the organizing committee and that he would make sure that the task group's work was part of the Symposium. Prof. Stepto reported that the project on starch characterization has outside support.

Prof. Chang proposed that the Task Group be given Subcommittee status. The proposal was seconded and approved by acclamation of the Division.

#### **8. Report on Polymerization Projects (Buback).**

Prof. Buback reported that Prof. Russell will be the new chairman of this Subcommittee. It currently has thirty-four members, two of whom are from industry. Members come from twelve countries. The goal of the Subcommittee is to determine and agree upon rate coefficients for polymerization reactions. This is difficult work because some coefficients are chemically controlled while others are kinetically controlled. A total of eleven papers have been published, many of which are highly cited; most have to do with propagation rate constants.

Current projects include: critically evaluated termination rate coefficients (two papers published), reliability of use of electronic spin resonance for quantifying radical concentration, propagation rate coefficients for radical polymerization in aqueous media (led by Prof. Lacik).

Prof. Lacik's project uses methacrylic acid to study polymerization in water. It has been observed to exhibit a range of  $k_p$  that varies with concentration. This behavior has been shown to be due to changes in the preexponential factor where the frequency factor is governed by the degree to which internal rotations are hindered.

Another project, led by Prof. Vana, attempts to develop a mechanistic model for RAFT. Both radical combination and disproportionation have been found to be partly responsible in the mechanism for retarding the reaction.

Feasibility studies are in progress for rate constants for ionic polymerization, chain transfer rate constants, rate coefficients in copolymerization reactions, rate coefficients in primary radical addition reactions, and rate coefficients in nitroxide mediated polymerization.

Several points were raised during the ensuing discussion. Prof. Penczek asked whether the influence of aggregation of species on rate constants has been considered in the Subcommittee's work. Prof. Buback responded that there have been cases where this has been considered. It was proposed that a plenary lecture on the work of this Subcommittee should be presented at the 2008 World Polymer Congress. Prof. Jin suggested that there be greater involvement of the Division in the organizing committee to insure that its work is included in the program of the WPC. Prof. Sawamoto pointed out that not only are the results but also the methodologies are important and asked how this was being communicated to researchers. Prof. Buback reported that the methods used in the work of the Subcommittee are well-known and accepted by scientists working in the field. Prof. Sydnes asked how the results are communicated to industry. Prof. Buback responded that industry provides financial support for the work and is very interested due to the importance of reliable rate constants for guidance in polymerization process development.

#### **9. Reports on Developing Polymer Materials Systems (Ober, Vohlidal, Work)**

Prof. Ober reported on the activities of the Subcommittee on Developing Polymer Materials. He stated that the goal of the Subcommittee is to identify new directions and projects for the Division in new areas of polymer science. Currently there are 33 members from fourteen countries. Two members are from industry. Current projects include the definitions of terms relevant to biorelated polymer science (lead by Prof. Vert), the terminology for self-assembled polymers and aggregations (jointly lead by Profs. Ober and Jones), the terminology for conducting, electroactive, and field responsive polymers (lead by Prof. Schué), and infrared spectra of conducting polymer nanotubes (lead by Prof. Trchova).

Prof. Trchova commented that her project on the IR spectra of conducting polymer

nanotubes will focus on establishing the mechanism for polyaniline nanotube formation in weak acids. Samples of the nanotubes are being distributed around the world for analysis. Prof Jin commented that the funding for this project was small because the Division has run out of funds.

Possible new project areas include polymer nanopatterning, biomedical polymers, energy-related polymers, polymers for photonics and optics, and polymers from renewable resources. Two sessions have been organized for the World Chemical Congress in Torino and there is a plan to organize a symposium at the World Chemical Congress in Glasgow in 2009. Prof. Sawamoto commented that it is important to communicate the interests of the Subcommittee to the wider community of polymer scientists to interest them in the work of the Division.

#### **10. Reports on Education Projects and Activities (Vairon, Sanderson, Ober)**

The activities of the Polymer Education Subcommittee were reported by the Task Group Chairmen for each of the ongoing projects.

Prof. Kratochvil reported that the post graduate course in polymer science, started in 1996, continues to be held. It provides opportunities for scientists from developing countries to learn to use modern scientific tools. Besides 50 hours of lectures over ten months, the course focuses on developing skills for research. The 11<sup>th</sup> course was completed in July 2007 with ten graduates. The 12<sup>th</sup> course will start in September with ten students enrolled. Since its inception in 1996 there have been 90 graduates, 96 papers in refereed publications, and 130 presentations at scientific meetings. Recent publications by the graduates have reported research performed with polyaniline and a poly(isopropylacrylamide) with a fast thermal response.

In Prof. Sanderson's absence, Prof. Vairon reported on the UNESCO Conference on Polymers in Stellenbosch. Fifteen countries were represented other than South Africa, however, only two other countries in Africa were represented, Zimbabwe and Botswana. The other participants who attended were from Europe. Strategies to increase representation from African countries are being discussed. Prof. Pasch commented that the original intention of the conference was educational. It has evolved into a scientific conference due to a lack of polymer science programs at African universities that can be supplemented by a post-graduate level educational program. Topics at the conference included polymers used for drug delivery and



attachment of poly(ethylene glycol) to proteins. An effort is now being made to get supported research started at African universities and to provide support for faculty members involved in polymer science at universities.

Prof. Hess reported that the 15<sup>th</sup> World Forum and Tutorial on Polymer Characterization (POLYCHAR) was held in Rio de Janeiro from 16-20 April, 2007. The money obtained from the Division was used to assist student attendance. There were 119 enrolled participants of whom 78 were students. Plans for future years are to hold POLYCHAR in India in 2008, in France in 2009, and in Slovakia in 2010.

Prof. Vairon reviewed the efforts to develop a program in polymer education in French speaking countries. A draft program has been completed and a critical analysis of the program is in progress. The materials needed for the lectures are now in preparation. Prof. Vairon expressed his frustration with individuals who have committed to developing lectures but who have failed to provide the agreed upon input.

Profs. Vairon and Ober reported that an on-line polymer education is now available through the IUPAC website. There has yet to be any feedback on the content. A CD is available that reproduces the information available at the website. It works with a PC operating system but still has problems for MAC users.

Prof. Mormann provided an update on his efforts to make training videos developed by companies available on the IUPAC website. This project has run into difficulties because the companies who have developed the videos do not want to lose control over the content.

Prof. Vairon summarized his conclusions drawn from the activities of the Polymer Education Task Group. He noted that established activities are working well, a website has been established, but newer initiatives have been essentially inactive, in large part because they have proved to be too time-consuming. The problem is that the Task Group needs input from countries where there is a need for improved polymer education opportunities. He provided several proposals: 1) Identify countries that have polymer education committees; 2) Textbooks are often in error, should the Polymer Division have a project to review textbooks? 3) Should the Division support 2-3 post-doctoral students from less developed countries? Moreover, should the Division become active in identifying young faculty members to serve as advisors to these post doctoral students? Prof. Kratochvil commented that Prof. Stejskal was already actively

working with post-doctoral students from developing countries. Prof. Tabak suggested that industry was interested in supporting educational initiatives in developing countries. He suggested that the Division should work with industry on our educational projects if they see that we are doing things that could help them. He believes that this will lead to greater funding for our educational initiatives.

#### **11. New Project Areas**

Prof. Jin started the discussion of possible new project areas by noting that the Division's current Subcommittees do not cover all areas of polymer science. He reported that Stan Penczek has proposed some new areas for consideration by the Division and asked Prof. Penczek to summarize his ideas. Prof. Penczek acknowledged that he has some thoughts about new topics for the Division, but that it is too early for him to talk about them.

#### **12. Monitoring of Projects (Jin)**

Prof. Jin reported that eight projects were initiated in 2006 and five more have been started in 2007. He expects two or three more to be approved this year. Some of the Subcommittees have failed to spend the funds granted to support their projects. It was noted by several members that the failure to spend allocated funds does not indicate a lack of activity. Much can be accomplished through the internet and face-to-face meetings at conferences that does not require monetary support. Prof. Jin requested that, whether funds are used or not, it is important that the Subcommittees report the status of their projects to the Division.

#### **13. Reports on Division-sponsored Conferences (Penczek, Kubisa), Rio (Ailton de Souza Gomes) and forthcoming World Polymer Congresses (Taiwan; U.K.;.....)**

Prof. Penczek reviewed the conference approval process. An organizer sends an application to the Secretariat. The Secretariat identifies the appropriate Division(s) and sends it to them for comment. Applications which are sent to the Polymer Division are sent to the Conference Task Group for comments. After review, the Conference Task Group then sends the application with its comments to the Division president, who then sends it to the Secretariat. The Secretariat informs the organizers of the decision. This is a time-consuming process that requires at least a year to complete. The Division's role is to provide guidance to the organizers. At present, about 50% of

the conference proposals come from outside of the Division with the remainder internally generated. It has frequently happened that we discover through informal contacts about a worthwhile conference that fits with IUPAC guidelines and need to provide encouragement to the organizers to seek IUPAC support. Once a conference has been held, it is desirable to publish a report of the conference. This should be a substantial report, not simply a one paragraph summary. An issue continues with the publication of papers. Many organizers would like to publish the proceedings in other journals besides *Macromolecular Symposia*.

Conferences over the last few years have ranged between six and ten each year, which seems to be about right for international symposia. In 2005 there were eleven conferences, in 2006 there were nine, and there have been seven to date in 2007. Two proposals were rejected in 2007. World Polymer Congresses planned include 2008 in Taipei, China and 2010 in the UK. The organizers have been urged to emphasize others besides Nobel prize winners as invited speakers. Prof. Kratochvil noted that some meetings were missing from the list and he provided a list of those meetings to Prof. Penczek.

Prof. Ober reported on the Conference on Macromolecules for a Sustainable, Safe, Healthy World, which was held in New York City in June, 2007. This was a continuation of the Kyoto Strategy meeting held in 2002. It was organized by Profs. Levon, Ober, Guiseppi-Elie, Gross, Nishide, and Smith. Topics included Health and Global Security, Sustainable Energy and the Environment, and Industrial Design. Representatives from 25 countries attended. The logistics of the meeting were handled by the ACS Polymer and Polymer Materials Science and Engineering Divisions. Prof. Stepto noted the five year gap from the Strategy meeting and asked if there was a plan going forward. Prof. Ober suggested that in the future the World Chemical Congresses would be utilized as the venue for meetings of this type.

Prof. dos Santos reported that the World Polymer Congress in Rio de Janeiro was very successful. He acknowledged the strong support provided by industry.

Prof. Chen reported on the status of WPC 2008 in Taipei. Six plenary lecturers have been invited and five have accepted. There have been 135 speakers invited, 80 have confirmed that they will attend. Symposia have been organized in ten topic areas, each split into multiple sessions. Prof. Stepto asked whether there would be reduced fees for students and IUPAC members? Prof. Chen responded that there would be

reduced fees. Prof. Jin noted that WPC 2008 has not yet been officially approved and urged the organizers to make their application as soon as possible. Prof. Penczek responded that he is working with the organizers to get this situation rectified.

Beyond 2008, a World Polymer Congress will be held in Glasgow in 2010. For 2012, Prof. Ober reported that Blacksburg, Virginia in the USA has nearly decided to apply to host a WPC at the Virginia Tech. A question was raised as to whether the ACS would be involved in organizing the WPC; Prof. Ober responded that Virginia Tech and the ACS Polymer Division were almost the same since the administration for the Polymer Division was supported by Virginia Tech. In 2014, both Thailand and Turkey have reported an interest in being the host country. Prof. Jin noted that Thailand is not currently a member of IUPAC and that this would need to be resolved before approval could be given for the conference. Whether Turkey is actually interested in being the host will be established within the next month.

Prof. Jin remarked that a very good meeting to celebrate the anniversary of the Korean Polymer Society was held in Korea. Many young scientists participated and an excellent program was developed by the organizers.

#### **14. Recruitment to the Division**

Prof. Ober noted that Prof. Dennis Smith, who works closely with the ACS Polymer Division is very interested in working with the IUPAC Polymer Division. In particular he wants to work to get younger scientists interested and involved in polymer science. Another potential new member is Prof. Galli.

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

Prof. Jones reminded everyone to send all information to be posted on the website to him. He will ensure that it is posted. It was noted that information about the conferences that take place in the Czech Republic have not been posted on the website. This will be corrected. Prof. Vairon asked whether the links exist to the list of national polymer organizations developed by Prof. Sawamoto? It does not, but will be added. Prof. Sawamoto agreed to send the necessary information to Prof. Jones.

## **16. Strategy, Communication, Polymer Summit (Horie, Sawamoto, Ober)**

Prof. Sawamoto presented a review of the relationship between different regional polymer federations in Asia, Europe, and the Pacific which IUPAC brings together. This also involves domestic organizations such as the ACS polymer and materials science divisions, the Japan Polymer Society, and the Korean Polymer Society. The booklet providing information about world polymer organizations was reissued in 2006 at the World Polymer Congress. It will be updated again for the WPC in Taipei. The project has been completed. New entries include international relations, exchange programs, and post-doctoral opportunities. Prof. Stepto noted that the IUPAC funds approved to support the Strategy work were not spent. Prof. Sawamoto said that the Society for Polymer Science, Japan supported his work and that he should have requested reimbursement from IUPAC, but he did not. Prof. Jin noted that Prof. Sawamoto needs to submit a final report on the project.

Prof. Ober asked whether it would be possible for the Polymer Division to work more closely with CHEMRAWN since a focus on the use of polymers in the solution of environmental issues was a major outcome of the meeting in New York in June. Prof. Jin responded that the Division is supposed to have a representative on CHEMRAWN.

Prof. Ober reported that a Symposium devoted to polymer science has been organized for the first time at the World Chemical Congress in Torino. 150 abstracts were submitted. He noted that it was critical to get the local organizers involved to make possible this symposium. He acknowledged the help of Prof. Beniamino Pirozzi for making it possible. Plans are already being made for Division participation at the World Chemical Congress in Glasgow in 2009. Prof. Lovell suggested that a symposium on Polymerization Kinetics be organized. Other suggestions include symposia on Developing Polymer Materials and the Molecular Characterization of Polymers. Prof. Buback and Prof. Chang both reported that they had been contacted by the Royal Society of Chemistry about their interest in organizing symposia on Polymerization Kinetics and Molecular Characterization of Polymers. Prof. Stepto volunteered to find out there is anything standing in the way of organizing these symposia. Planning for the Symposium on Developing Polymer Materials is already moving forward.

A mini-summit to explore possible ways to cooperate internationally was held at the meeting in June in New York City. Participants agreed to work towards developing

world links to polymer educational web-sites under the IUPAC umbrella and to explore possible ways for web-based discussion sites and bulletin boards to be provided. Web bulletin boards and discussion groups are proposed as ways to help scientists in developing countries become aware of educational and job opportunities. It would also be a place to post local problems for input by international scientists. Also discussed were possible areas of cooperation at jointly held conferences, in particular conferences and symposia aimed at graduate students that would be organized in a way similar to Gordon conferences. Prof. Vairon suggested consideration of "Flash" conferences, meaning conferences organized in an impromptu fashion on current topics, that would be held in Europe. Participants would pay for the hotel and food, but nothing else. Finally, those at the mini-summit thought it could be worthwhile to develop a summer-school program for young scientists.

#### **17. Budget, Projects and Division Structure (Jin, Ober)**

Prof. Jin reported that the financial support provided by Samsung and the royalties from Wiley constitute a large fraction of the Division budget, \$88,000. Of that total only \$5600 remains unspent. Most of it goes to support projects with only a small amount used for administrative expenses. Support for the Division from IUPAC for the next biennium will only increase by 3%. The DSM relationship that is developing will provide more money for use in organizing symposia. Old projects which have made no progress will be cancelled and it is hoped that those allocations can be returned to the Division reserve. Prof. Stepto noted that the royalty proceeds from Wiley publications of Division approved Macromolecular Symposia comes directly to the Division. Prof. Jin is able to allocate that money to projects as he sees fit. Prof. Hess suggested that because the Division profits from the relationship with Wiley, we should make every effort to publish proceedings in Macromolecular Symposia; we should, therefore, work with organizers and Wiley to ensure that the papers are of high quality. Prof. Vairon noted that for WPC 2004 there were 2000 papers which could not all be published in a single issue. Prof. Hess suggested that only the invited lectures be published in Macromolecular Symposia. Currently each Division approved conference published in Macromolecular Symposia results in \$1000 for the Division. There was a general discussion of where best for Division sponsored symposia to be published. There is a general feeling that the quality and speed have improved. Organizers can now choose where to publish. It is up to the Division to establish a structure and expectations.

Prof. Stepto noted that the Division has the smallest Division budget and the most projects. Prof. Jin responded that the Bureau considers our outside funding as part of the total and that keeps IUPAC support low. Dr. Reichmanis suggested that this was unfair and that she would take the Division's case to the Bureau meeting.

#### **18. Division Elections 2007 (Ober)**

Prof. Ober was happy to report that the Division elections were completed electronically with the following results:

Elected as Division Officers:	Prof. Michael Hess (Secretary)
Elected to Titular Membership:	Prof. Gregory Russell (Polymerization) Prof. Richard Jones (Terminology) Prof. Mitsuo Sawamoto (Strategy and Projects) Prof. Robert Stepto (Industrial Relations) Prof. Jean-Pierre Vairon (Education)
Elected to Associate Membership:	Prof. Sung-Chul Kim (Structure and Properties) Prof. Michael Buback (Polymerization) Prof. Przemyslaw Kubisa (Conferences) Prof. Tatsuki Kitayama (Terminology) Prof. Michel Vert (Developing Polymers) Prof. Werner Mormann (Education)

Subcommittee chairmen and representatives to IUPAC standing committees were selected from those elected and those active in the Division:

- Prof. Jones: Chairman of Subcommittee on Polymer Terminology
- Prof. Vairon: Chairman of the Polymer Education Subcommittee
- Prof. Jones: Division Representative to the ICTNS
- Dr. Dykstra or Dr. Work: Division Representative to COCI
- Profs. Hodge and Kahovec: Division Representatives to Division VIII.
- Prof. Ober: Division Representative to CHEMRAWN
- Prof. Mormann: Division Representative to Division III.
- Prof. Sawamoto: Editorial Board for Pure and Applied Chemistry

Prof. Kratochvil noted that relations between the Polymer Division and Division VIII

leaves much to be desired and that we need to find a way to work more effectively with them.

#### **19. Vice– President’s Topics (Ober)**

Prof. Ober suggested that the focus activities for the Division should be to involve young scientists and industrial scientists in Division work, to develop stronger ties to polymer activities in developing countries, to strengthen the Division’s role in education, and to develop closer ties to industry. He proposed two new ad-hoc committees; one to update the Division rules with respect to the conduct of elections and a second to identify how the Division can better utilize the internet for communications.

Following Prof. Ober’s overview was a discussion of how to better involve industry in the Division. Dr. Reichmanis suggested that it was very important to communicate the importance of IUPAC to industry. Prof. Stepto suggested that the work in the Structure-Properties Subcommittee may be studied as an example of how to develop projects that are more relevant to industry. Prof. He noted that the next Structure-Property meeting would probably be held in Brussels and that Division representatives may wish to participate to learn more about its success with industry. Profs. Stepto and Ober agreed to try to attend this meeting. Prof. Kratochvil suggested that the General Assembly in Puerto Rico may be a good place to develop better communications with industry since it has the highest industrial chemical production of any place in the world

#### **20. Any Other Business**

No other business was discussed.

#### **21. Date of Next Meeting**

The Division meeting in 2008 will be held in Taipei on June 28-29. The meeting on the 28<sup>th</sup> will continue all day and the 29<sup>th</sup> will be for ½ day. Prof. Penczek suggested that business be completed in one day if possible.