IUPAC POLYMER DIVISION MEETING

45th IUPAC General Assembly

Crowne Plaza Hotel

Glasgow, Scotland.

9.00−12.30 & 14.00−17.30, 31.July

09.00-12:30 01.August. 2009

Those attending: Giuseppe Allegra (Italy), Ayse Aroguz, (Turkey), Dusan Berek (Slovakia), Christopher Bielawski (USA)-observer, Michael Buback (Germany), Kan-Nan Chen (Taiwan), Dick Dijkstra, Germany, Claudio dos Santos (Brazil), Giancarlo Galli (Italy), Kurt Geckeler, (Korea)-observer, Jiasong He (China), Michael Hess (Germany), Roger Hiorns (France), Phil Hodge (UK), Jung-Il Jin (Korea), Richard Jones (UK), Joannis Kallitsis (Greece), Tatsuki Kitayama (Japan), Pavel Kratochvíl (Czech Republic), Przemyslaw Kubisa (Poland), Graeme Moad (Australia), Werner Mormann (Germany), Christopher Ober (USA), Harald Pasch (South Africa), M. Raza Shah (Pakistan)-observer, Stanislaw Penczek (Poland), Greg Russell (New Zealand), Dennis Smith (USA), Jaroslav Stejskal (Czech Republic), Robert Stepto (UK), Supawan Tantanayon (Thailand), Miroslava Trchová (Czech Republic), Cem Tuncel (Turkey), Jean-Pierre Vairon (France), Jiri Vohlidal (Czech Republic), Andrew Whittacker, (Australia), Majda Zigon (Slovenia)

Temporarily present as guests were Eva Åkesson (CCE), Marc Cesa (COIC), Peter Lovell (UK), Peter Mahaffy (CCE), Fabienne Meyers (Secretariate), and Supawan Tantayanon (Thailand).

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

Chris Ober welcomed the Division members and observers to the Division meeting in Glasgow. He also very cordially welcomed the President of IUPAC (the former President of the Polymer Division) Jung-Il Jin. The previously distributed meeting agenda was briefly discussed and accepted (see Appendix I). While the Polymer Division continues to be one of the most active Divisions concerning handling and attracting IUPAC projects, nevertheless continuous efforts are required to maintain this high standard and to improve it. In particular, the Division is involved in a number of interdivisional projects with Division VIII and Division II (Interdivisional Subcommittee on Materials Chemistry).

Finally, Chris Ober asked for a moment of silence in remembrance of Dr. Val Metanomski (CAS) and Prof. Irene Schöll-Bitai (Wien) who have passed away.

2. Apologies for Absence

Absent members sent their apologies together with greetings to the Division.

3. Approval of the Minutes of the Division Committee Meeting, Taipei (Taiwan), July 2008

The minutes recording the discussion for the 2008 meeting in Taipei were accepted with no dissenting vote.

4. Matters Arising

No specific item that will not appear later during the meeting had to be addressed at this point.

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

Dick Jones reported progress in the Subcommittee on Macromolecular Terminology (SPT) over the last 2 years.

The Subcommittee of Polymer Terminology (SPT) met in Taiwan between 24th & 27th June 2008. Annual meetings are to review the progress of all active projects and to lay plans for future initiatives. Within the Polymer Division, the definition of terminology in macromolecular and polymer science and technology is conducted under the auspices of the Sub-committee on Polymer Terminology (SPT) to which Division VIII delegates the additional responsibility for guiding the progress of projects in polymer nomenclature. In the period covered by this report, the Subcommittee has worked on 24 projects, 7 of which are concerned with polymer nomenclature or are nomenclature-related.

Publications since the Torino GA 2007

1. The publication of the new edition of the 'Purple Book' under the name *Compendium of Polymer Terminology and Nomenclature* (project number 2002-048-1-400), the previous edition having been called the *Compendium of Macromolecular Nomenclature*. Strictly speaking it is not just a second edition.

   The compendium now comprises 13 chapters of terminology and 9 chapters related to nomenclature, all of which are based on documents previously published in PAC. An introduction reviews the history of terminology and nomenclature activities within the Polymer Division. An appendix presents a bibliography of bio-polymer nomenclature.

2. The publication in PAC of the following projects have also occurred:

   - 2000-007-1-400: Glossary of terms relating to polymeric gels and networks, hy-

brid inorganic polymeric materials and the processing thereof;

- 2002-016-1-400: Terminology for the kinetics, thermodynamics, and mechanism of polymerization;
- 2002-014-1-400: Glossary of class names of polymers based on their chemical structure and molecular architecture;
- 2008-022-1-400: Dispersity;
  This is a single-term recommendation that is considered to be of the utmost importance to the polymer community and which has been accepted for re-publication by *Polymer International.*
- 2001-082-1-800: Terminology and nomenclature of macromolecules with cyclic structures.

Future output

1. The following project has undergone public review, been accepted for publication in PAC and is in the final stages of consideration by ICTNS:

   - 2002-006-2-400: Terminology for radical polymerizations with minimal termination - the so-called "living" and/or "controlled" radical polymerization (at publication, these recommendations are expected to be appear under the title 'Terminology for reversible-deactivation radical polymerization previously called 'controlled' radical or 'living' radical polymerization).

2. The following projects are nearing completion with submission predicted within the period 2010-11 as indicated:

   - 2002-017-1-400: Polymerization processes and polymers in dispersed systems (late 2009);
   - 1999-051-1-800: Nomenclature for chemically modified polymers (late 2009/early2010);
   - 2003-019-2-400: Definitions of terms relating to crystalline polymers - revision of IUPAC Recommendations 1988 (2010);
   - 2005-005-2-400: Definitions of terms relating to individual macromolecules, their assemblies, and dilute polymer solutions (2010);
   - 2006-004-1-400: Recommendations for the abbreviation of polymer names (revised title) (2010);
   - 2001-081-1-800: Terminology and structure-based nomenclature of dendritic and

hyperbranched polymers (2010);

- 2004-043-1-400: Terminology relevant to bio-related polymer science and applications (2011);
- 2005-043-2-400: Terminology for self-assembly and aggregation of polymers (2011).

3. The following projects are still in preparation with end-dates expected beyond mid-2011:

- 2003-060-2-400: Terminology on separation of macromolecules;
- 2000-037-1-800: Nomenclature for macromolecular rotaxanes (revised title);
- 2003-042-1-800: Source-based nomenclature of single-strand linear and graft polymers; *
- 2006-028-1-400: Terminology for stimulus-responsive polymers (revised title);
- 2006-041-1-400: Glossary of thermal and thermomechanical properties of polymers;
- 2007-008-1-400: Development of a multilingual encyclopaedia of polymer terminology;
- 2008-015-1-400: Preferred names for polymers;
- 2008-020-1-400: Revision of "IUPAC Recommendations on Macromolecular Nomenclature – Guide for Authors of Papers and Reports in Polymer Science and Technology;
- 2008-032-1-400: Basic guidelines to polymer nomenclature

4. An application for the following project has been submitted:

- Terminology of nanomaterials and nanotechnology in polymer science.

5. The following feasibility studies are ongoing:

- Stereochemical notation in polymers
- Nomenclature in inorganic and coordination polymers
- List of 'key words'

Chris Ober thanked Dick Jones for the report and thanked in particular the editorial group of the Purple Book with Dick Jones as the driving force for the completion of this important publication of the Division.

6. Report on Structure−Properties Projects (Dijkstra, Kim)

Since Sung-Sul Kim was unable to attend the meeting, Dick Dijkstra presented a report on the activities of the Subcommittee on Structure−Properties of Commercial (SC). The Subcommittee currently involves 65 members from 12 countries. Membership is well balanced between academics and industry (33 from industry and 32 from academia).

Dick Dijkstra gave a short summary of the history of the Subcommittee its structure, goals and ways to operate.

The following projects are completed:

IUPAC No. 1999-020-1-400

Quantifying scratch resistance of commercial polymers.

Task Group Leader: Dr Rob Bailey, ICI, United Kingdom

IUPAC No. 1999-039-1-400

Stucture and properties of cyclic olefin copolymers.

Task Group Leader: Prof Sung Chul Kim, Korea Advanced Institute of Science and Technology, Korea

IUPAC No. 2002-052-1-400

Structure and properties of polyester elastomers composed of poly(butylene terephthalate) and poly(ε-caprolactone).

Task Group Leader: Prof Toshikazu Takigawa, Kyoto University, Japan

IUPAC No. 2004-009-1-400

Guideline for rheological characterisation of polyamide melts.

Task Group Leader: Dr Dick Dijkstra, Bayer Material Science, Germany

Projects that will be completed during the next biennium (2010-11):

IUPAC No. 2003-038-4-400

Structure and properties of linear and crosslinked structural polyvinylchloride (PVC) foams

Task Group Leader: Prof Volker Altstädt, University Bayreuth, Germany

IUPAC No. 2003-051-1-400

Structure and Properties of polymer/clay nano-composite materials.

Task Group Leader: Prof Sung Chul Kim, Korea Advanced Institute of Science and Technology, Korea

IUPAC No. 2003-009-1-400

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

Task Group Leader: Dr Erik Wassner, BASF, Ludwigshafen, Germany

IUPAC No. 2005-023-2-400
Microstructural, melt processing, and mechanical properties of compatibilized PA6/ABS blends.
Task Group Leader: Dr Helmut Steininger, BASF AG, Germany

IUPAC No. 2007-004-1-400
Guidelines for shear rheometer calibration and performance check
Task Group Leader: Dr. Rüllmann, Elastogran GmbH, Germany

IUPAC No. 2004-044-2-400
Microstructure and properties of thermotropic liquid crystalline polymer blends and composites
Task Group Leader: Prof Jiasong He, Institute of Chemistry, Chinese Academy of Sciences, China

FEASIBILITY STUDIES
Feasibility Study 9
Comparison between experiment and simulation of extrudate swell
Co-ordinators: Magnus, Dr De Vries
Feasibility Study 14
Characterization, rheology and mechanical properties of high and ultra-high molecular weight polyethylene
Co-ordinators: Prof Bucknall, Dr Dijkstra
Feasibility Study 15
Rheology of volatile systems
Co-ordinators: Dr Wassner
Feasibility Study 16
Comparison of different CaBER (Capillary Breakup Extensional Rheometer) devices
Co-ordinators: Dr Wassner

Publications 2007 /2009

D. J. Dijkstra, W. F. Zoetelief, Proc. Polym. Proc. Soc. PPS24, Salerno, Italy (2008)
IUPAC guideline for rheological characterisation of polyamide melts.

S. Venkataramani, J. H. Lee, M. G. Park, S. C. Kim, *J. Macromol. Sci. Part A. Pure Appl. Chem*. 46 (1), 65 (2009) Structure and Properties of Polyamide-6 & 6/66 Clay Nanocomposites.

D. J. Dijkstra, *Pure Appl. Chem.* 81, 339 (2009) Guidelines for rheological characterization of polyamide melt

G.T. Lim, F. Ramsteiner, V. Altstädt, *Journal of Cellular Plastics,* online*,* (2009) Understanding the Compressive Behaviour of Linear and Crosslinked PVC Foams.

F. Fischer, G.T. Lim, U.A. Handge, V. Altstädt, *Journal of Cellular Plastics,* accepted, (2009) Numerical Simulation of Mechanical Properties of Cellular Materials using Computed Tomography Analysis.

Finally, Dick Dijkstra reported about recent problems with publishing manuscripts from SC in P&AC asking for an official IUPAC statement:

SC uses to publish its first manuscript in P&AC while subsequent papers are sent to other journals if the results are academic of character. Many of the publications of SC are more technical than academic, so that P&AC used to be the right publication medium, as it can also be drawn from the 'Procedure for publication of IUPAC Technical Reports and Recommendations'. Recently, a controversy has risen with ICTNS concerning the publishing policy of P&AC. This is based on an article in CI by Jack Lorimer, Feb. 2008. Its central statement says that manuscripts with new experimental data are not acceptable for P&AC and should be published elsewhere to get better exposure.

The papers of SC may in fact contain new experimental results, focussed, however, on very specific topics. The common technical reports (TR) are usually much broader in content.

To avoid problems in the future the question 'if manuscripts containing new experimental data are acceptable for publication in P&AC', should be solved on a higher level.

Then, if the answer is 'no' should there be corresponding official statement in the *Procedure for Publication of IUPAC Technical Reports and Recommendations* in the IUPAC Handbook?

If the answer is 'yes', should there be a corresponding statement in the *Procedure for Publication of IUPAC Technical Reports and Recommendations* in the IUPAC Handbook including qualifications that narrows it down to papers originating directly from Subcommittees of Divisions?

The decision about this problem lies probably beyond the scope of ICTNS and there is no time to lose since it unduly delays publications. Therefore the chairman of SC asks the Division President to make this a case at the Bureau and bring the problem to John

Jost and David Black.

An active discussion followed during which Michael Buback observed that strictly following the ICTNS policy P&AC might be forced some day to publish otherwise rejected papers while at the same time some groups are not particularly enthusiastic about publishing their results in P&AC.

Jung-Il Jin agreed that the official guidelines should be more specific.

The general impression was that the point raised by Dick Dijkstra is urgent and it appears to be best to officialize the problem following the formal way, to agree upon a strategy, and to find allies. The Division President was asked to take corresponding action.

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

Harald Pasch presented the report of this Subcommittee in the absence of Taihyun Chang. The Subcommittee comprises 22 members from 12 countries.

Task Group Leader: Nyambeni Luruli

Project Title: Repeatability and reproducibility of sample preparation and analysis in high-temperature SEC

Task Group Leader: Robert Bruell

Project Title: Efficiency and reproducibility of temperature rising elution

Task Group Leader: Bastiaan Staal

Project Title: FractionationAccuracy and reproducibility of functionality type analysis of poly(ethylene oxide) homo and copolymers by LC-CC

Task Group Leader: Melissa Fitzgerald

Project Title: Terminology and measurement techniques of starch components

Task Group Leader: Bob Gilbert

Project Title: Critically evaluated techniques for size separation characterization of starch.

Harald Pasch identified the presently most prominent problems in polymer analysis:

- Characterization of new olefinic polymers
- High throughput analysis

- Analysis of complex polymers
- Characterization of new hydrophilic copolymers and polyelectrolytes

The Subcommittee suffers from the following major problems that reduces the efficiency of the group considerably:
The majority of participants are from industry and there is quite some fluctuation and members cannot continue their project in a new environment, so that assignment to specific tasks is prone to rapid change.
Many companies these days do not allow sufficient time for non-job related experimental work.
The urgency for many projects is not always seen. Relative methods are favoured, and a philosophy that rather acknowledges that 'our system works (good enough for us)' but there is presently no need to know why it works. The problem is not so much the scientists but the management of companies, which does not see the need to participate in general research for the community.
Michael Buback raised the question why the management of many companies is not overwhelmingly interested. Separation techniques should be of great interest. Is there, on the other hand, a statement from companies that explicitly show interest, he asked.
Harald Pasch observed that the name of the Subcommittee might be changed to Subcommittee of Molecular Characterization of **Industrial** Polymers to point out that the projects dealt with are far from being just 'academic'. Jung-Il Jin supported the idea of modifying the Subcommittee's name.
Dick Dijkstra addressed the fact that many analytical units in companies have been 'out-sourced' and are prone to high economical pressure. The rate of conducting an analysis might be frequently seen as more important than the quality and relative results as sufficient. Efficiency frequently is interpreted in terms of just throughput and profit.
Jung-Il Jin observed that a higher contribution from academia to run projects seems to be advised.
Harald Pasch answered that there is the problem that there are not so many academic chairs dealing with polymer-analytical and characterization problems. Also the universities are under economic pressure and forced to raise money from outside combined with the problem of a high fluctuation of coworkers in times where residual times of advanced students at universities are increasingly shortened.
Bob Stepto raised a question about the future development of the Subcommittee with the open question of the continuation of Taihyun Chang, Dusan Berek as AM from January 2010 and Harald Pasch in a position of kind of a 'NR for Africa'.

Dusan Berek described the present situation:

Size exclusion chromatography clearly dominates the techniques used, this, however, is frequently done in an inadequate way. In particular the quality of results from academia is rather bad because the people running the experiments are frequently doctoral students with a high rate of fluctuation.

In case of copolymer characterization just Size-exclusion chromatography is used although more sophisticated techniques are required as are reference materials. He suggested that IUPAC should organize the availability of reliable reference materials. He also complained about the fact that the rules of measurement (in chromatography) are frequently not followed, where industry is used to be in general better than universities. He stressed that a project by Gregorio Meira, Argentina, concerning band broadening, a very important phenomenon, should be pursued.

Harald Pasch did not believe that the behaviour at universities can be changed significantly, and that there much more interest is in exotic polymers than in dealing with 'normal' polymers. People in general have to be convinced that it is important to improve the quality of analysis significantly in particular in terms of reliability and reproducibility. The scatter of round-robin tests is very high. From his point of view there are enough sources of reliable reference material.

Chris Ober summarized the main problems in stating that the progress of projects is too slow although the projects are all well grounded and good with highly qualified members in the working parties, hampered, however, by the described boundary conditions. He suggested to have small-group discussions about the strategy to improve the situation and to involve the Subcommittee Education (Jean-Pierre Vairon). Dusan Berek agreed to care for the contact.

8. Report on Polymerization Projects (Greg Russell)

The Subcommittee comprises 34 members from 13 countries. 32 members are from academia and there are two directly from industry. Under the headline "Modelling and Mechanism of Free-Radical Polymerization" the aim of the Subcommittee is to systematize and critically evaluate kinetics, mechanisms, rate constants etc. of this class of very important reaction - one reason among others being the technological importance, another the discrepancies found in literature.

The importance and acceptance of the numerous publications of the subcommittee can be determined from the number of citations that goes up to more than 350 (within 8 years). The working parties of all projects are very active, meeting twice a year on average.

The main focus of the projects lies presently on the topics: termination rate coefficients, vinyl pivalate propagation, propagation in aqueous phase, RAFT polymerization kinetics, and Polymerization terminology.

Projects are:

"Establishment of quantitative reliability of electron spin resonance techniques for polymerization kinetics"

Leader: Bunichiro Yamada (now retired), succeeded by Per Zetterlund

The project was completed in 2007, 1 publication

Currently in progress are the projects:

"Critically evaluated termination rate coefficients for free-radical polymerization. 1. Current status, evaluation of experimental methods, data for styrene and methyl methacrylate"

Leader: Greg Russell
2 publications, 3rd in preparation
the project is close to finalization and a sequential project is in preparation

"Critically evaluated propagation rate coefficients for free-radical polymerization of water-soluble monomers polymerized in the aqueous phase"
Leader: Igor Lacík
1 publication

"Towards a holistic mechanistic model for reversible addition-fragmentation chain transfer (RAFT) polymerizations:
Dithiobenzoates as mediating agents"
Leader: Philipp Vana
1 publication

"Terminology for radical polymerizations with minimal termination - the so-called "living" and/or "controlled" radical polymerization"
Leader: Aubrey Jenkins
Joint project with the Division IV Subcommittee on Polymer Terminology"
Recommendation close to submission
Future project ideas are:
"Critically evaluated termination rate coefficients as a function of conversion"
"Critically evaluated initiator decomposition and initiator efficiency data"

"Critically evaluated chain-transfer rate coefficients and constants"
"Critically evaluated depropagation rate coefficients"
"Critically evaluated copolymerization reactivity ratios"
"Critically evaluated combination/disproportionation ratios"
"Critically evaluated chain-length-dependent termination rate coefficient"
"Nitroxide-mediated polymerization: benchmark rate coefficients"
"ATRP: current situation on mechanisms; benchmark coefficients *k*p for PEG-ylated MMA"
"Primary radical addition"
"Quantum-chemical calculation of RP rate coefficients: guidelines"
"Critically evaluated rate coefficients for ionic polymerizations"

(A "critical evaluation" always includes recommendation of methods and issuing of guidelines for their use.)

A general problem is to find leaders for these proposals. Mitsuo Sawamoto raised the question of how to deal with these projects that mainly produce numbers and asked for the influence of reaction conditions and progress of the reaction. Michael Buback emphasized the importance of reliable rate constants to understand the behaviour of the systems and to develop a reliable theory for the processes. An easier presentation of the data and a reduction to only a few examples was suggested to show the important correlations and dependences. Jung-Il Jin admired the wonderful data and proposed to present them in a generally more digestible form, maybe as a review document, so that broad availability of this knowledge is granted and he stressed the importance of an extensive use of the data obtained by the scientific community.

9. Reports on Developing Polymer Materials Systems (Jaroslav Stejskal)

Jaroslav Stejskal 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, however, there are problems to define the future strategy of the Subcommittee.

Currently there are 25 members from 16 countries. Two members are from industry. Current project:

Infrared spectra of conducting polymer nanotubes (Miroslava Trchová)

So far the progress of the project was according to the time schedule and the cooperation of all groups involved may be considered exemplary:

1. Polyaniline has been prepared in the solutions of strong and weak acids and in

water. Polyanilines and the corresponding bases were distributed to project participants (September 2007).

2. The participants recorded FTIR spectra of 6 distributed samples dispersed in FTIR pellets and some of them interpreted them or add additional analysis. All participants have answered before October 2008.
3. The results were summarized by the project coordinator (M. Trchová, June 2009).
4. The draft of the Technical report for the publication in the Official Journal of the IUPAC *Pure and Applied Chemistry* will by prepared by M. Trchová (July/August 2009) and distributed to the participants for the discussion (September 2009).
5. The project progress will be reported as a poster communication at the 45th IUPAC General Assembly and 42nd IUPAC Congress, Glasgow, UK (August 2009) and at the IUPAC Polymer Division meeting organized on that ocassion.
6. The coordinator will prepare the final manuscript of the Technical Report for the publication in the *Pure and Applied Chemistry* (later in 2009, but before its end).

In continuing the discussion started on the Taipei meeting 2008, Jaroslav Stejskal questioning the project policy of the Subcommittee Developing Polymer Materials (SCDM) Systems, and asked what the meaning of new projects under the scope of the SCDM means.

Chris Ober observed that the meaning of the Subcommittee's name should not be taken too limited, again the name of the Subcommittee does not reflect its field of activity precisely Experimental activities should also be considered. Miroslava Trchová's project serves as an excellent example. Some of the projects identified and initiated by SCDM have meanwhile been moved, for example, to SPT because they are terminology. Also, educational aspects should be considered. The members of the SCDM and also the leadership of the other Subcommittees are asked to feed in new ideas for SCDM to deal with.

Jean-Pierre Vairon suggested to organize a process of brain-storming in this field and expand the view as far into the future as possible in order to identify promising developments well in advance.

Jaroslav Steijskal asked which body exactly should do that and missed proper definitions of 'developing polymers or polymeric materials'.

Bob Stepto suggested to address all members to show more initiative and to encourage discussion and more contact.

Michael Buback observed that the name of the Subcommittee might be misleading because nobody would ever talk about new developments they have in mind, so industry will not be interested. The remit of SCDM should therefore focus on bringing

people together. IUPAC might not be able to really contribute, however it could provide a platform for contacts.

Dick Dijksta agreed that industry will keep their secrets. Chris Ober suggested to go back to the roots and consider pre-competitive developments focus on basic properties instead of special developments. He suggested to contemplate on a revision of the Subcommittee's name.

Bob Stepto saw the SCDM with a different mission compared with the 'common' Subcommittees in that it should present kind of a 'think tank'.

10. Reports on Education Projects and Activities (Jean-Pierre Vairon)

The Subcommittee Polymer Education is in charge of planning for the International Year of Chemistry 2011 (IYC) as mentioned above, providing new, teaching materials, freely available in the internet, international research funding, improved communication between scientists to encourage hiring of students and post-docs from developing regions to better train researchers, raise their level of expertise and form professional networks by establishing links to polymer education groups in the world. In detail the output of the individual working parties (WP) as given by the WP leaders since the Taipei-meeting was:

1. WP1 : Educational Courses, Workshops and Conferences

Ongoing projects are:

- **UNESCO/IUPAC Postgraduate Course** organized by Pavel Kratochvil, Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Praha, http://www.imc.cas.cz/en/imc/unesco.html

The 13th run of the Course has been in progress since November 2008 and will be concluded by the final seminar in July 2009. 8 students from the following countries have been attending: Algeria, Brazil, India, Macedonia, Poland, Russia. More than a half of the projects is likely to result in publications in international journals or communications at meetings.

The preparations for the 14th run of the Course are in final stages. 14 have been nominated Their nationalities are: Brazil, Cameroon, Hungary, India, Iran, Poland, Russia, Ukraine. The Course is going to start in October 2009 and will be concluded in July 2010.

1. The Course has, in fact, become a global activity. Students from all continents except Australia and North America have graduated. 2. The average publication output is more than one paper in high impact journals, almost two conference

communications and about 14 citations per graduate. Of course, the distribution of bibliometric hits per individual is very non-uniform. 3. In several cases, a productive long-term co-operation has developed between the Institute and the graduate's mother institution. 4. In the last five years, seven graduates became doctoral students at Czech universities. 5. Graduation of the Course often enhanced professional promotion in the home countries of the graduates. 6. The Course contributes to a positive image of IUPAC both inside and outside the professional community at virtually no cost for the Union.

- the tutorial (**Short Course in Polymer Characterization**) offered before the annual IUPAC-sponsored POLYCHAR Conference, Rouen, France, in 2009). http://www.unt.edu/POLYCHAR/ Task Leader : J. Grenet / M. Hess

Again it was obvious that the tutorial is of good educational use (in particular for students) to become familiar with recent developments in analytical techniques. Frequently, participating in the Short Course facilitates the understanding of conference lectures for students new in this field. However, not only students having contact with polymer science for the first time join these courses, also advanced students, scientists from other disciplines and people from industry are among the participants.

The 2009 Short Course were presented by the lecturers mentioned below with the following topics :

Michael Hess: Thermophysical methods (DSC, TGA),
Kevin P. Menard: Dynamic mechanical analysis,
Dusan Berek: Chromatography,
Goerg H. Michler: Microscopy for Morphology,
Witold Brostow: Tribology,
C. Lorthioir: Solid-State NMR spectroscopy,
J.M. Guenet: Light, Neutrons, X-rays Scattering by Polymer Systems,
Helmut Muenstedt: Rheology

Each lecture lasted at least 60 min and provided time for discussion during the lecture and later. There were about 50-60 participants from all over the world and the fee could be waived for the students.

- **10th Annual UNESCO School in conjunction with the IUPAC Conference on Macromolecules & Materials** (in collaboration with the Macromolecular Society of South Africa) 7-11 September 2008, Berg-en-Dal Restcamp, Mpumalanga,South-Africa.

http://academic.sun.ac.za/UNESCO/Conferences/Conference2008/HOME2008.htm

Task leader : Ron Sanderson, South Africa.

2. WP2 : **Design of Polymer Education Material for French Speaking Countries**

Project in conjunction with CCE, the project has been completed June 2009. Task Leader: Gerard Froyer

Definition/implementation of a « french speaking » common teaching program in Polymer Science (bachelor level), associated with common teaching materials. Six countries were involved (Belgium, Canada, France, Mauritius, Morocco, Romania)

The time-table was

1st step : Defining a draft program

2nd step : Critical analysis – finalization

3rd step : Materials for illustration : inventory of existing « French speaking » materials in universities/web sites

4th step : Implementing a common « on-line » french speaking lecturing network

The different subgroups worked along the lines defined previously (polymer chemistry, solid state, etc..) and the material elaborated (slides, etc..) was made available to all participants through a web platform (IMN-Nantes) to allow suggestions about its content.

The final task (3rd step) was completed in very close connection with colleagues of the French Polymer Group Education Committee who were very active and played a major role in the different working subgroups.

On May 14-15th, 2009 was held in Nantes the final meeting of the project ('Design of education material for French-speaking countries'). Nine participants from Canada, Romania and France attended this meeting. The purposes were to review the existing educational material, and to schedule the other commitments in order to make this material available for French-speaking colleagues. About 400 slides illustrating different chapters of Polymer Science have been designed during all the project duration.

They are grouped together into 6 chapters forming an expanded introduction to polymers: *Introduction to polymer science, Polymer chemistry, Polymer solid state, Simulation of polymer chains, Rheology and processing*, *Electrical and optical properties of polymers*.

It was planned that other topics of interest in polymer science will be accessible

soon: *physical chemistry, mechanical properties, and biopolymers*.

All the contents will be installed soon on the French Polymer Group website. They will be available from the IUPAC Poly Edu web via the link with GFP.

A further step (Task 4) would be to implement an « on-line » French speaking lecturing network. This might be considered as a new educational IUPAC project.

3. WP3 : Elaboration of an IUPAC sponsored CD on Polymer Education

Task Leader: Chris Ober

Concerning the contents of the CD accessible on the Div IV Polymer Education Web site,

« .... The various and rather complete educational materials need to be sorted and their presentation should be structured. The sub-committee members are asked to download the documents, to express their opinion about the educational content and to provide (asap) their comments and/or modification proposals. »

No feedback by June 2009 (!).

4. WP4 : Developing of the Division IV - Polymer Education Website

Task Leaders: Chris Ober, Jean-Pierre Vairon

Education materials approved by the subcommittee are progressively inserted on our Poly Edu site http://old.iupac.org/polyedu/.

Since 2008 many contacts with the existing national polymer education subgroups and/or national polymer groups have been established, and, with their agreements, the links with their sites have already been added on our Poly site. The goal is to identify, advertise and network the polymer education activities and potential projects developed in the different countries, and to share the educational material with on-line interactivity. No doubt that this task is of key importance and will be continuously developed.

5. WP5 : Polymer Teaching video clips data base

Task Leader**:** Werner Mormann

An unsolved problem with this database is the question of intellectual property, which seems to be a major obstacle. The division of Macromolecular Chemistry in the German Chemical Society (GDCh) been approached. Dr. Hans-Wilhelm Engels, Bayer Material Science AG, Leverkusen at that time chair of the division has been contacted and the topic has been discussed at a meeting of the division board in 2008 and members have been informed. There has been *no* resonance. Contacts with Bayer and with BASF revealed that the two companies see difficulties to

extend their educational efforts beyond the present level. Though some further contacts and discussions took place there does not seem to be enthusiasm for the idea. The task has been abandoned.

6. WP6: Boosting the Polymer Education in Africa

Task Leader**:** Ron Sanderson, South Africa, with Dhanjay Jhurry, Mauritius

The sub-committee has proposed to engage a networking of the potentially concerned countries irrespective of their languages (essentially english/french) or communities. Contacts should be established via universities, industry, chemical societies, polymer groups, etc.., in order to identify the needs and means to develop polymer science/education. It is asked to Ron Sanderson and Dhanjay Jhurry to initiate this operation as soon as possible and to provide a preliminary report (with proposals) at the 2007 sub-committee meeting in Torino, see Educ. Report 2006. This inventory has still not been engaged, and the task is abandoned.

7. WP7 : Reviewing of polymer science textbooks

Task Leader : Stanislaw Penczek

This new task is very important but sensitive. It doesn't aim at producing and diffusing critical evaluations of newly published textbooks but at friendly helping the authors optimize their teaching books on the scientific content, IUPAC terminology rules or even pedagogical approach. A pilot action has been engaged in 2008. Nevertheless this time consuming task needs to be precisely structured before being implemented. It could be either a confidential interactive exchange between the author(s) and a specialist from our Polymer Division or a closed discussion forum joining the author(s) and small specialized working groups also from our Division. The point will be considered at the Edu sub-committee meeting in Glasgow.

8. WP8 : Showcase pilot program for a research cooperation between international funding organizations and IUPAC as represented by its Polymer Division.

Task Leaders *:* Chris Ober, Jean-Pierre Vairon, Werner Mormann, Dennis Smith

As presented at the 2008 Division meeting in Taipei (cf. the 2008 Poly Edu sub-committee report), the Polymer Division is implementing an international call for proposals which will be a showcase to initiate innovative IUPAC actions. The project will allow not only to boost the international collaboration in polymer research but also to identify and support brilliant young researchers and PhD students, thus highly contributing to polymer education. This multilateral

International Call for Proposals, scientifically piloted by IUPAC, will be supported worldwide by funding and research organizations.

An IUPAC Committee on Chemistry Research Funding (CCRF), composed of IUPAC Officers and of those in charge of chemistry from major international funding agencies, has been set up in Philadelphia, August 15th, 2008. It aims at implementing different world scale projects to encourage the research collaboration in the chemical sciences. It was considered to launch the showcase pilot program -a thematic multilateral call for proposals- submitted by our Polymer Division. A further meeting in Madrid, November 9th, 2008, gathered the Poly Div delegates (Jean-Pierre Vairon, Werner Mormann) and the representatives of the funding/research organisations potentially considering to participate (NSF-USA, DFG-Germany, CNRS-France, IRCSET-Ireland, MICIIN-Spain, FAPESP-Brazil, FWF-Austria, FCT-Portugal, etc.). The frame, procedures and technical organization of the call were discussed and defined. The proposal was accepted by the following CCRF meeting in Washington, December 4th, 2008, and it was decided to prepare a Consortium Agreement joining IUPAC and the partner funding agencies. This agreement has since been elaborated and will be signed by the organizations and IUPAC at the CCRF meeting in Glasgow, Monday 3rd, 2009. The multilateral call (joint applications of 3 partners from 3 different countries) will be launched by September 2009, the two-stages reviewing process and selection will take place from November 2009 to July 2010, the final decision will be taken by August 1st, 2010 and the funding should start by December 2010.

A central secretariat of the Call, piloted by D. Smith, will be established at the IUPAC main office, thanks to the special support of NSF.

Further scientific (topics) and technical (eligibility, procedures) details will be presented at the Glasgow Division meeting.

9. Conclusions on 2008-2009 activities

- Although some non engaged activities are abandoned, several new and promising actions have been completed or are developing fairly well and could progressively modify our current approach of polymer education:
- definition/implementation of a « French speaking » common teaching program in Polymer Science associated with common teaching materials
- on-line interactive networking of the education groups of the different national Polymer (or Chemical) Societies.
- IUPAC reviewing of the newly published textbook contents and interactive contact with the authors.

- networking young polymer scientists and students via implementation of a multilateral call for proposals with joint applications, piloted by Division IV but funded by the relevant national Funding Agencies or Research Organizations.

11. Monitoring of Projects (Buback)

Michael Buback observed that the projects that are run by the Division are quite different in character. Some are easy to run while other projects are more difficult to organize due to the different tasks an fluctuation in the WP-members, in particular when those have leading positions. It is essential for the Division to have continuity in the progress of projects and in the identification of new projects. Little activity is observed from the scientific community to initiate new projects in the area covered by the Polymer Division.

The Division Vice-President stressed that it is important for project leaders to:

- Announce the official start of a project
- Give annual reports well in advance of the Division meeting (February every year through the chair of the corresponding Subcommittee). This is in particular important for the Division President's report to IUPAC.
- A maximum of 6 months should be allowed after a project has officially expired to close the subject. Extension of a project has to be considered well in advance but should be the exception

He observed that the problem of publication of project results as discussed under top 6 has to be kept in mind and the recommendations of the referees should be followed. Projects are essential for the existence of Subcommittees. The project stages are: preparation (feasibility study), working phase, publication with an effective supervision of the progress by the corresponding chair person. In most of the cases these guidelines are already followed, however, there are some projects left to be finished that are overdue since some time.

12. Reports on Strategy and Communication (Sawamoto)

Mitsuo Sawamoto was not able to attend the Division meeting because of a short-notice official appointment he had to keep, and he was excused.

13. Reports on Division-sponsored Conferences (Kubisa)

Przemyslaw Kubisa pointed out that in general there is no financial support from

IUPAC to conferences. Exceptions are conferences *New Directions in Chemistry - Scientifically Emerging Regions.* The financial support granted from IUPAC is of the order of USD 4000 per conference. Detailed information is provided by the IUPAC website. The conference statistics for the years 2008/2009 is shown in the following table:

Year	2008	2009
Number of conferences	**7**	**9**
No of publications in Macromol Symp	**3**	**3**
No of pages	**459**	**566**

Since the last Division Meeting in Taipei there were the following conferences:
29 June - 4 July 2008, Taipei
MACRO 2008 Polymers at Frontiers of Science and Technology
July 20-24 2008, Prague
Prague Meetings on Macromolecules - 48th Microsymposium "Polymer colloids
September 7-11 2008, Düsseldorf
4th International Symposium on Macro- and Supra-molecular Architectures and Materials
September 8-11 2008, Mpumalanga, South Africa
10th Annual UNESCO/IUPAC Conference on Macromolecules & Materials
October 15-18 2008, Zhenjiang, China
International Symposium on Novel Materials and their Synthesis (NMS-IV),
Feb. 15-17 2009, Melbourne, Australia
Materials of the Future - Science of Today, Radical Polymerization -The Next Stage
April 20-24, 2009, Rouen, France
17th International Conference on Polymer Characterization (POLYCHAR-17)
June 7-9 2009, Mainz, Germany
Frontiers in Polymer Science - International Symposium 50th Anniversary of *Polymer*

June 28 –July 1 2009, Chicago, Illinois, USA
2nd International Conference on Self-Healing Materials
July 5-9 2009, Montréal, Canada
13th International IUPAC Conference on Polymers & Organic Chemistry (POC-'09)
July 5 - 9, 2009, Prague, Czech Republic
73rd Prague Meeting on Macromolecules: New Frontiers in Macromolecular Science
July 26-31 2009, Cracow, Poland
IP-09 Ionic Polymerization

Future task for the TM in charge of conferences is to identify potential sponsorships, to initiate an official letter from IUPAC authorities to actively encourage organizers of corresponding conferences to apply for IUPAC sponsorship and to assist in submitting the application form. Bob Stepto supported the idea that the Officers responsible for conferences should become active and look out for candidate-conferences.
The information about IUPAC sponsorship on the IUPAC website appears to be rather sparsely and should be improved. He also addressed the problem of publishing the conference output in Macromolecular Symposia since this medium has been removed from the Scientific Citation Index in 2006 and is no longer covered by Current Contents. Since there are annual royalties from Macromol. Symp. Volumes corresponding to IUPAC-sponsored conferences in the order of magnitude of USD 6,000 per year, strategies should be developed to encourage organizers to have the conference proceedings published in Macromol. Symp. A new platform for conference proceedings has not yet been established in the publishers scene.
Przemyslaw Kubisa pointed out that the IUPAC website dealing with conference sponsorship should be revised. There is no need for a long time in advance before a conference for the submission of an application. The corresponding IUPAC body should be contacted for revision.

14. Report on Division Web Page and Electronic Publications (Jones, Hess)

The Division members have been asked during the Taipei-Meeting to check the correctness of the corresponding website. However, the response was week but there are still blank websites. Fabienne Meyers handles the webpages but she requires input. The website of the SPT is recommended as a suitable model.

It was stressed that a powerful representation of the Polymer Division through the presentation of the philosophy, activities, and achievements of its Subcommittees is inevitable since the websites are the windows to the outside world, not only to the

scientific community. It was agreed that each Subcommittee chair should send corresponding information to Dick Jones by the end of September 2009.

15. Recruitment to the Division

Chris Ober stated that it lies in everybody's responsibility to recruit suitable possible candidates for the Division. Proposals should be made to the Division President who can invite them officially. Another option to get new people involved in the Division's activities is to involve them in existing projects.

16. New Project Areas – International Year of Chemistry; International Funding Cooperation (Mormann, Vairon, Smith);

Werner Mormann reported of recent progress concerning the activities of the Committee on Chemical Research Funding (CCRF). Pilot projects have been started 2004-014-1-020 and 2006-013-1-20 and a tentative time schedule that plans the start of grants for the year 2011, the International Year of Chemistry has been set up. Meetings took place in Philadelphia and Washington DC.

The **International Research Funding (Pilot) Project** (IRFP) has been launched by the Polymer Division with the IUPAC task group on 'International Research Funding in Chemical Sciences'. Discussions in Washington DC in 2008 resulted in a detailed plan to call for proposals involving (at least) three scientists and students from minimum three countries as a part of the Division's educational efforts. The call will soon be launched (see Chemistry International). A symposium assembling all participants is planned to celebrate the IYC in 2011. Successful applicants will invited to speak on the Polymer Congress 2012 in a special Session.

IUPAC will provide scientific monitoring without being involved in costs. The project is thought as a 'show case' program for cooperation between National Funding Agencies and IUPAC (represented by Division IV).

Chris Ober announced that the staff crew at the IUPAC headquarter would support the organization of the paper work. The Secretariat feels positive about the project and wants to see it go.

Michael Buback raised the question of the budget and who will decide about the applications.

Werner Mormann answered that three topics will be identified and the cooperation of three (minimum) researchers from three (minimum) countries can submit a joint proposal that will be evaluated by external reviewers involving the corresponding national funding agencies.

It was realized that the agreement of all national funding agencies is required. The budget

accounting should follow the respective customs.

The role of IUPAC was questioned, and Chris Ober observed that there are different approaches in different countries and that problems are in particular to be expected when the number of countries exceeds two and only one proposal should be submitted by the group. Not all countries appear to be really enthusiastic and given this situation the Polymer Division could mediate and monitor the process.

Bob Stepto prompted that the Polymer Division should collect the proposals and identify the most promising ones, assist in finding referees and provide contacts but provide no financial assistance.

Pavel Kratochvil asked if in particular junior scientists should be considered. The answer was that this is not accepted by most of the National Organizations. For the start of the program the year 2011 is envisaged so that the program is closely linked to the IYC but not a part of it. Pavel Kratochvil suggested that IUPAC should head the whole project officially in the first place, then link it to the IYC.

Chris Ober welcomed two guests from the Committee of Chemical Education (CCE), namely the Chairman Peter Mahaffy and the Secretary Eva Åkesson, and Fabienne Meyers. The focus of CCE with respect to the IYC will be on sustainable developments, presentation of chemistry, the biennial Conference on Chemical Education, neutral information about chemistry. Topics should directly address students and teachers. Chris Ober expressed the interest of the Polymer Division in joint activities and would like to see the Polymer Societies of all countries working together in a coordinated fashion that could be moderated by IUPAC with the ambition to achieve better public understanding of the polymers and polymer-related facts, opportunities and drawbacks.

Jean-Pierre Vairon observed that the Polymer Education website could serve as a vehicle to transport actual information and to explain the value of Chemistry in the example of Polymer Chemistry to society. The website is free accessible and can be used multi-lingually.

With Majda Zigon as contact person people from all countries (in particular participants from developing countries) can be linked, to collect ideas and material from education and also from science and the corresponding technology to show how these fields directly influence daily life.

Michael Buback stressed the importance to address people who do not know about Chemistry and also to get politicians involved.

Chris Ober emphasized the important role of the corresponding local Societies. Jean-Pierre Vairon reported about the problems to get media and politicians interested and involved and suggested that IUPAC should start an initiative on a larger scale. He also referred to the fact that there is almost no education in Polymer Chemistry in Africa and that on

request no feedback was obtained.
Pavel Kratochvil mentioned the Committee that is involved in ethics in Chemistry and numerous activities in UNESCO.
Fabienne Meyers mentioned CI as a forum and conferences as a suitable medium to forward information to the 'outside world' through publicity in media.
Chris Ober welcomed the chairman of the Committee on Chemistry and Industry (COCI), Marc Cesa. Purpose of the visit was to present the work of COIC and to discuss relations between Polymer Science and the industrial world, future cooperations of the Commission and the Polymer Division.
COCI is within IUPAC focused on issues of importance to the global chemical industry. At the present time there are 85 companies in 17 countries have joined COIC as Company Associates (CAs). COIC brings together sound scientific judgement to decision-making in government agencies and NAOs. Possible sponsors can be offered an Associate Memberships through IOCI. This construct offers new tools for cooperations with regional workshops where IUPAC representatives, NAOs, and CAs meet, share experience and background, where new ideas can be created, how cooperation can be organized in different countries or regions. This IOCI platform can also be used to identify projects or programs for the IYC, for fundraising, internship programs for young scientists, successful technology transfer, and ensuring the public acceptance of chemistry. It further contributes to capacity-building and sustainable development by providing training in critical areas, for example safety and toxicology, thus helping to ensure a continuous supply of well-trained internationally mobile chemists.
Benefits from IUPAC's internationally recognized activities are access to critically evaluated and validated physico-chemical data and methods, internationally agreed nomenclature and technology, monographs and critical reviews.
The CAs are asked to take the advantage for professional development of their scientific and technical staff within IUPAC and they are asked to nominate employees to participate in IUPAC projects and activities of industrial interest.
IUPAC holds highest standards of chemistry providing neutrality and objectivity on all chemical issues from science or politics and is cooperating with organizations such as WHO or UNESCO. One of the most important goals of COCI, however, is to improve public appreciation of chemistry by publicizing the benefits of chemistry to society, attracting students and trainees to chemical disciplines, and identifying and communicating global best practices. Special emphasis lies here on spreading this in developing countries and make it accessible there.
There is a IUPAC-UNESCO Safety training program for practitioners to gain direct experience from IUPAC Company Associates throughout the industrialized world

covering all aspects of chemical health, safety, and environmental issues. There are also workshops in safety and chemical production to share best practices.

Thus, COCI is eager to spread knowledge and to improve public perception through education, training, and responsibility, creating a platform to influence decisions based on expertise and reputation, fostering worldwide communication linking academia, industry and public sector science to provide trusted and independent views on chemical issues.

Ongoing projects are presently I the field of safety training with regular workshops and the publication of monographs. New projects are among others for example on biomonitoring, biofuels, or nanotechnology safety.

Chris Ober acknowledged the goals of IOCI as impressive and very useful and promised that the Polymer Division would look for overlaps and fields of cooperation.

Pavel Kratochvíl asked if IUPAC is involved in the EU regulations for handling chemicals. IUPAC appears not to be active in this field.

Tatsuki Kitayama recommended interaction with ISO.

Michael Buback was concerned about the industrial support given the bad economical situation and stressed the importance of safety aspects in chemistry and the role of IUPAC as a neutral forum to discuss safety aspects, make them public and provide contact to training programs and experts.

Bob Stepto's question about the ACs and the number of companies out of the polymer field involved is answered in detail by the IOCI website.

17. Future IUPAC WORLD POLYMER CONGRESSES

Professor Ayse Aroguz, University of Istanbul, offered the application for one of the future MACRO Conferences with a remarkable presentation of the facilities in Istanbul, and excused the absence of Professor Yussuf Yagi because of visa problems. The conference can be held in the Conference Valley with a capacity of 2,300 or in the Hilton International Hotel, 1,500 participants. About 20 young scientists could probably be sponsored (travel expenses), in particular those from developing countries. The organizing Committee can refer back to a number of well-organized international conferences. There is enough room and professional assistance for the lectures and poster presentations as well as good organized social programs. The presentation of Ayse Aroguz was positively received by the Polymer Division and will be considered again in the future when the conference will be organized again in the Euro-Asian region.

Since the representatives from Virginia Tech could not arrive on time since they were technically trapped at an east coast airport, Dennis Smith gave a report about the state of the art of the MACRO 2012. The conference is scheduled June 24th-June 29th 2012 and is

ready to deal with about 1,500 participants. There will be low-budget rooms available in dormitories on the campus for around USD 35. Room will be provided for about 400 posters, and video stream transmission is planned for the plenary lectures. A short course in polymer science is planned and an educational session in the program. The website is www.macro2012.org

Michael Buback asked for the reason of the early date and the on-line plenary session. The time schedule is due to the teaching season at Virginia Tech. The video transmission (and recording) shall enable a greater audience to participate. The video will also be available later. The budget situation is satisfactory.

The well-organized presentation of Professor Supawan Tantayanon, Chulalongkorn University Bangkok, for MACRO 2014, Pattaya, Thailand (21.07.-25.07.2014) given during the Taipei-meeting 2008 was well remembered by the Division and the up-date showed further improvement. So far the Chemical Society of Thailand, the Polymer Society of Thailand, the Chulalongkorn and the Mahidol University are involved. The conference fee will presumably range from USD 500 to USD 750. The venue will be the Dusit Thany Pattay Hotel with a convention hall and a number of smaller meeting rooms. Accomodation from first class to budget (≈USD 50 and less) are available. The title of MACRO 2014 will be 'Polymer Science on Sustainability and Economic Sufficiency'. 6 plenary speakers and 100 invited speakers are planned and about 1000 active participants are expected. A number of young scientist, in particular from developing countries will have the chance to be supported with a limited number of grants also for travel. Jung-Il Jin observed that obviously the preparations for MACRO 2014 in Pattaya are in a very good shape. Suwapan Tantayanon was encouraged to carry on and she thanked the Division for accepting the Thai proposal stressing that it is important to make the reservations well in advance.

Peter Lovell reported in short about the finals of the preparation for next year's MACRO 2010 (11.-16.07.2010, Glasgow, Scotland) which has the subtitle 'Polymer Science in the Service of Society'. Young scientists will be given a special platform to present their activities. More details will be shown in the program. All awards will be given at the lecture with the first plenary lecture dedicated to the DSM Award. There are 8 plenary lectures a' 60 min, 29 keynote speakers with 45 min, 67 invited speakers with 30 min and 306 contributed talks with 15 min. Space will be provided for 3 poster sessions a' 300 posters. 25 ordinary and 3 special sessions (DSM, Young Scientists, Education) are being prepared. There will be the DSM Performance Materials Award, the Polymer International – and the Samsung Award. Participants who expect visa problems should ask the organizers well in advance for a letter of support.

18. Division Elections 2009 (Buback)

Michael Buback reported about the election for the service period starting January 1st 2010. The election was prepared by the Nomination Committee consisting of P. Kratochvíl, H. Nishida, M. Buback, C. Matyaszewski, and M. Droescher.

The Division Structure starting with January 1st 2010 now reads:

Titular Members

G. Russell (Polymerization Kinetics) 2008-2011

R. Jones (Terminology) 2008-2011

M. Sawamoto (Strategy) 2008-2011

R. Stepto (Industrial relations) 2008-2011

J.-P. Vairon (Education) 2008-2011

D. Dijkstra (Characterization) 2010-2013

P. Kubisa (Conferences) 2010-2013

Associate Members

D. Berek (Characterization) 2010-2011

R. Hiorns (Terminology) 2010-2011

J. Stejskal (Developing Polymers) 2010-2011

D. Smith (Conferences) 2010-2011

J. He (Structure and Properties) 2010-2011

W. Mormann (Education) 2010-2011

Dr. Graeme Moad	NR	2010-2011	Australia
Prof. Kan-Nan Chen	NR	2010-2011	China/Taipei
Prof. Jukka V. Seppälä	NR	2010-2011	Finland
Prof. Ram Prakesh Singh	NR	2010-2011	India
Prof. Giancarlo Galli	NR	2010-2011	Italy
Prof. Joon-Seop Kim	NR	2010-2011	Korea
Prof. Wan Md. Zin Wan Yunus	NR	2010-2011	Malaysia
Prof. Muhammad Raza Shah	NR	2010-2011	Pakistan
Prof. Majda Zigon	NR	2010-2011	Slovenia
Prof. Yusuf Yagci	NR	2010-2011	Turkey

Michael Buback congratulated and welcomed the new TMs and AMs.

19. Vice-President's Topics (Buback)

As important goals for the coming years he stressed the importance to involve more young scientists in the Division's work and to work on improving industrial contacts. In particular in times when there are strong economical restrictions industry appears to be rather restrictive with granting time for participation of employees in IUPAC meetings or allow off-production measurements for example to contribute to round robin tests, to name some examples. Industry has to be convinced about the advantages of participating in IUPAC activities, respectively in having active members in IUPAC bodies.

The Division's activities in Developing countries have to be enforced. Sometimes it is difficult to find appropriate contact partners. The Division Members are asked to contribute to these efforts.

The IUPAC label has to be strengthened so that it becomes well-known as the first address when things are dealing with Chemistry, respectively Polymer Chemistry.

The Vice-President asked the Division Members to think intensively about new projects because they are the major source of money to run the annual meetings.

The Division needs to broaden its offers and provide experts for solving actual problems in science, technology and society.

In the coming years he will also focus on strengthening the ties to the National Adher-

ing Organisations as vital parts of IUPAC's activities.

The successful project monitoring will be further improved in order to make the Division's work more effective.

Michael Buback also wants to see the NRs more tightly bound into the activities of the Division activities in particular in the creation of new projects and participation in running projects.

The financial support provided by Samsung and the royalties from Wiley (Macromol. Symp., see above) still constitute a large fraction of the Division budget. Most of it was spent 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. The royalty proceeds from Wiley publications of Division approved Macromolecular Symposia comes directly to the Division.

The Division President stressed the importance of an improved concept for the Divisions development and focus for the future and the need for new projects with a high public attention and impact. He pointed out that the budget is limited and that projects with a high budget decrease the number of projects. As a standard value a funding increase of about USD 1,000 to USD 2,000 per annum can be assumed.

20. Any Other Business

Since there was no further business identified the Division President thanked all Members, Observers, and guests for their vivid and active participation in the 2009 Division meeting and led over to the final topic.

21. Date of Next Meeting

The President thanked all participants for their contributions and expressed his best wishes for a safe travel home looking forward to see everybody next year again in good health.

The Division meeting in 2010 will be held before the IUPAC MACRO 2010 in Glasgow, Scotland, on Saturday July 10th and Sunday July 11th 2010.

Michael Hess, 1 October 2009
(Secretary)

APPENDIX 1

IUPAC POLYMER DIVISION MEETING

General Assembly 2009

Crowne Plaza Hotel, Glasgow

9.30−12.30 & 14.00−17.30, July 31, 2009; 9.00−12.30, August 1, 2009

Agenda

1. President's Introductory Remarks and Finalizing of the Agenda
2. Apologies for Absences
3. Approval of the Minutes of the Division Committee Meeting, Taipei, June 2008
4. Matters arising
5. Report on Terminology and Nomenclature Projects (Jones, Kitayama)
6. Report on Structure−Property Projects (Dijkstra, Kim)
7. Report on Molecular Characterization Projects (Pasch, Chang)
8. Report on Developing Polymer Materials Systems (Vert, Stejskal)

Photosession during break

9. Report on Polymerization Projects (Russell)
10. Report on Education Projects and Activities (Vairon, Mormann)
    Visit by CCE Representative
11. Monitoring of Projects (Buback)
12. Strategy, Communication (Sawamoto)
13. Reports on Division−sponsored Conferences (Penczek, Kubisa), and forthcoming World Polymer Congress (US; Pacific Region; Europe)
14. Report on Division Web Page and Electronic Publications (Jones, Hess)
15. Recruitment to the Division (Penczek)

Day 2

16. New Project Areas - International Year of Chemistry; International Funding Cooperation; open to people for suggestions from floor
    Visit COCI Representative
17. Further discussion of IUPAC World Polymer Congresses – GB; USA; Thailand; Turkey
18. Division Elections 2009 (Buback)
19. Vice−President's Topics (Buback)
20. Any Other Business
21. Date of Next Meeting

APPENDIX 2

Total Commitments and Operations 2008-9

	Commitments (Actual)	% of Total Budget (Guideline: 70 %)	Operations (Actual)	% of Total Budget (Guideline: 30 %)	Total Operations & Commitments (Actual)	Total Operations & Commitments (Budget)	Over/ (Under)	Per Cent Spent
Division I	28,500	43.6%	15,703	24.0%	44,203	65,300	(21,097)	67.7%
Division II	24,450	46.0%	30,910	58.1%	55,360	53,200	2,160	104.1%
Division III	19,300	35.5%	12,959	23.8%	32,259	54,400	(22,141)	59.3%
Division IV	41,000	75.2%	13,392	24.6%	54,392	54,500	(108)	99.8%
Division V	31,550	53.8%	26,645	45.5%	58,195	58,600	(405)	99.3%
Division VI	34,000	50.0%	24,267	35.7%	58,267	68,000	(9,733)	85.7%
Division VII	26,000	43.1%	17,782	29.5%	43,782	60,300	(16,518)	72.6%
Division VIII	31,300	39.1%	44,635	55.8%	75,935	80,000	(4,065)	94.9%

30.09.2009

Project Expenses vs. Budget

Through 28 August 2009	Actual	Budget	Budget Over/ (Under)	% of Budget	Planned End Date
400-Macro					
Samsung Fund Income	25,500	36,460	(10,960)	70%	
Wiley VCH Royalties	5,000	9,980	(4,980)	50%	
1999-020-1-400 Bailey	6,000	6,000	-	100%	31-Dec-2003
2000-028-1-400 Russell	2,864	3,000	(136)	95%	30-Jun-2003
2002-006-2-400 Jenkins	7,272	7,000	272	104%	31-Dec-2007
2002-014-1-400C Vohlidal	3,200	3,200	-	100%	Completed
2002-016-1-400C Penczek/Moad	4,250	4,250	-	100%	Completed
2002-017-1-400 Slomkowski	2,000	2,000	-	100%	31-Dec-2004
2002-048-1-400C Wilks	209	-	209	100%	Completed
2002-057-1-400 Sawamoto	2,950	3,000	(50)	98%	1-Dec-2007
2003-009-1-400 Wassner	-	-	-	-	30-Jun-2008
2003-019-2-400 Allegra	3,835	5,000	(1,165)	77%	30-Sep-2008
2003-023-2-400 Meira	3,500	3,500	-	100%	1-Jan-2007
2003-038-4-400 Alstaedt	4,427	8,000	(3,573)	55%	1-Jul-2010
2003-051-1-400 Kim	6,007	6,000	7	100%	31-Dec-2006
2003-060-2-400 Chang	6,500	6,500	-	100%	31-Dec-2007
2004-009-1-400C Dijkstra	3,000	3,000	-	100%	Completed
2004-022-3-400 Fitzgerald	420	7,000	(6,580)	6%	30-Apr-2007
2004-034-1-400 Lacik	3,000	3,000	-	100%	1-Dec-2007
2004-037-1-400 Froyer	4,937	5,000	(63)	99%	30-Jun-2009
2004-040-1-400 Vana	3,498	3,500	(2)	100%	1-Sep-2007
2004-043-1-400 Vert	5,909	10,000	(4,091)	59%	1-Apr-2010
2004-044-2-400 He	5,390	6,000	(610)	90%	1-Nov-2009
2005-005-2-400 Chang	6,000	6,000	-	100%	31-Dec-2008
2005-007-1-400 Wilks	-	-	-	-	31-Dec-2005
2005-009-3-400 Brüll	-	4,000	(4,000)	-	1-Jul-2008
2005-011-3-400 Luruli	2,344	5,000	(2,656)	47%	31-Dec-2008
2005-021-3-400 Staal	-	5,000	(5,000)	-	31-Dec-2007
2005-023-2-400 Steininger	1,000	3,000	(2,000)	33%	31-Dec-2010
2005-043-2-400 Ober	6,000	6,000	-	100%	1-Apr-2009
2006-004-1-400 He	4,300	6,000	(1,700)	72%	1-May-2010
2006-018-2-400 Trchova	2,000	2,000	-	100%	1-Jul-2009
2006-028-1-400 Vohidal	5,340	6,000	(660)	89%	1-Sep-2009

Project Expenses vs. Budget

Through 28 August 2009	Actual	Budget	Budget Over/ (Under)	% of Budget	Planned End Date
2006-041-1-400 Hess	3,997	6,000	(2,003)	67%	31-Dec-2010
2007-004-1-400 Rullmann	172	4,000	(3,828)	4%	31-Dec-2010
2007-008-1-400 dos Santos	5,000	5,000	-	100%	1-Sep-2010
2007-027-1-400 Singh	3,500	3,500	-	100%	31-Mar-2008
2007-049-1-400C Kratochvil	5,000	5,000	-	100%	Completed
2007-058-1-400 Gilbert	-	6,000	(6,000)	-	31-Mar-2010
2008-015-1-400 Mormann	1,370	6,000	(4,630)	23%	30-Jun-2011
2008-020-1-400 Hodge	758	5,000	(4,242)	15%	31-Aug-2010
2008-022-1-400C Stepto	-	-	-	-	Completed
2008-028-1-400 Auhl	-	5,000	(5,000)	-	31-Dec-2011
2008-032-1-400 Hiorns	1,840	5,000	(3,160)	37%	31-Dec-2011
2009-015-1-400 Mormann	-	3,000	(3,000)	-	31-May-2010