

# IUPAC POLYMER DIVISION (DIVISION IV)

Report to Council for 2008 – 2009

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### 1. Objective

The objective of this report is to summarize activities of the Polymer Division (Division IV) for the past two years and to lay out future plans. In particular, new developments in 2008-2009 up to the Bureau Meeting, April 16-17, 2009, Bratislava, Slovak Republic will be highlighted. The division presently has six subcommittees besides the Division Committee.

### 2. Off-Year Division Committee Meeting, June 2008

The Off-Year Division Committee Meeting was held in Taipei, 28-29 June 2008. We expect to have good representation at the meeting. In all 26 members (7 TMs, 6 AMs, 2 NRs, 11 Subcommittee Members) attended the meeting. The minutes will be posted on the web after being approved by the next Division Committee meeting scheduled on 31 July –1 August 2009, Glasgow, Scotland. The 43<sup>rd</sup> World Polymer Congress (MACRO 2010, Organizer: Prof. Peter Lovell) will also be held in Glasgow, 11 - 16 July 2010. As a new ongoing tradition, a symposium for young polymer scientists will take place. We will also present the 3 division sponsored awards at this meeting. The WPC held biannually is the very largest polymer congress in the world sponsored by Division IV and the next one is going to be held in Blacksburg, Virginia, USA, from 1-6 July, 2012 with Prof. Tim Long as the lead organizer.

### 3. Sub-committees and responsibilities

During the last two years the Division has operated with six sub-committees. Both Developing Polymers and Polymer Education are the newest sub-committees and are making good progress.

<b>Division Subcommittees (2008-2009)</b>		
1. Polymer Terminology	Chairman	R. G. Jones
2. Structure and Properties of Commercial Polymers	Co-chairmen	D. Dijkstra
		S. C. Kim
3. Modeling of Polymerization, Kinetics and Processes	Chairman	G. Russell
4. Developing Polymer Materials	Chairman	M. Vert
		J. Stejskal
5. Polymer Education	Chairman	J.-P. Vairon
6. Molecular Characterization of Polymers	Co-chairmen	H. Pasch
		T. Chang

All the TMs and AMs have been involved in the activities of the 6 Subcommittees. In addition there were small groups of Division members responsible for initial evaluation of the Applications of Sponsored Conferences, recruiting New Members, the Division Web Page and Electronic Publication and fostering International Cooperation focused on the IYC. In light of the necessity to strengthen the Division's activities connected to Industrial and International Relations, Bob Stepto a former division president was asked to serve in this role.

#### **4. Projects**

Division IV remains one of the most active divisions in attracting and handling projects.

Some of the projects are interdivisional especially with Division II and III. A list of the current projects is compiled by the Secretariat and is available at the IUPAC web site.

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This division also is actively involved in interdivisional projects especially with Divisions VIII and II (Interdivisional Subcommittee on Materials Chemistry). Presently, 11 projects (some of them extensions of earlier projects) with 2007 -, and 2008 - numbers are ongoing (Appendix I). We expect several new projects to be approved this year. In the past year a several projects were granted extension due to the need to expand or modify the original projects. Extension applications, however, were thoroughly discussed by the Subcommittee and also in the Division meeting for their justification. The Chairman of each Subcommittee closely monitors relevant projects including progress reports from the Task Force Leaders.

Reports on each Subcommittee's activities especially in relation to projects and subcommittee meetings can be found in the Division Meeting minutes that is posted on the IUPAC web site. Minutes from the most recent division meeting at the 2008 World Polymer Congress held in Taipei will be posted subsequent to approval during the 2009 WCC in Glasgow, Scotland.

One of our most significant terminology projects has just been completed, The Purple Book, has just been released. *Compendium of Polymer Terminology and Nomenclature, IUPAC recommendations 2008* [RSC Publishing](#), 2009 [ISBN 978-0-85404-491-7] Congratulations to the editors, especially Prof. Richard Jones.

## **5. Conferences**

In the immediate past and current years, 12 sponsored conferences were or are scheduled. Just as the Torino WCC hosted the first technical sessions devoted to topics related to the Polymer Division interests, the Glasgow WCC will also host symposia organized by and related to Division topics. We are grateful to the Glasgow organizers for enabling us to do this. It is our ongoing goal to continue to carry out organization of polymer-focused symposia at future WCC.

The World Polymer Congress (June 2008, Taipei. Organizer: Prof. Show-An Chen) attracted more than 1,200 participants from 50 different countries. The IUPAC web site describing sponsored symposia lists the additional conferences sponsored by Div. IV. In addition the WPC 2010 will be held in the same venue as the current WCC. It would be good in future to better coordinate WCC and WPC locations so that these repeats do not occur. In addition, several more conferences to be held in 2009 are in the process of being granted IUPAC sponsorship. WPC 2012 is scheduled for early July in Blacksburg, VA, USA and WPC 2014 is expected to be in Asia with the frontrunner for host being Thailand.

## **6. Fostering Cooperation among International Polymer Societies via the International Year of Chemistry**

At the recent IUPAC World Polymer Congress (WPC) and as a follow-up to IUMACRO-07, a mini-summit was held between the Polymer Division and representatives of several international polymer societies to discuss possible areas of co-operation. Attendees included representatives of the European Polymer Federation, the Japanese Society of Polymer Science, the Korean Polymer Society, and the American Chemical Society. Several topics for greater co-operation were identified including education, the developing world and in sponsoring symposia aimed at younger polymer scientists. Invitations have gone out to continue these discussions at the upcoming WCC and to build a program around the International Year of Chemistry. At the moment the current ideas include:

1) Joint symposia and conferences - There are a variety of possible topics including polymer education, the impact of polymers on society, etc. It might be very nice to hold joint programs

at the meeting of the European Polymer Federation or with the Asian Pacific Federation as well as during the Puerto Rico IUPAC General Assembly. Joint symposia might be focused on younger polymer scientists. A direct result of prior discussions was the International Young Polymer Scientist Symposium held at MACRO 2008 in Taipei. We will explore particular topics or other ways to work together.

2) An enhanced web presence - the IUPAC Polymer Division has established an education web site that it is working to improve. Currently it rates very high in Google searches of “polymer education” and is continuing to climb. The web address is:

<http://www.iupac.org/polyedu/> This web site links to educational web sites in over 4 continents and 8 countries and distributes without cost an educational CD that explains the basics of polymer chemistry. It might be appropriate, for example, to include video messages from distinguished polymer scientists representing different parts of the world celebrating IYC. This web site could also list events focused on polymers related to the IYC.

3) The value of polymers to society - the IUPAC polymer division has spoken with members of the polymer industry and they are interested in communicating the value of polymers to society. While this is a difficult year to talk to industry due to the economy, they might in future years (by 2011) be interested in supporting this.

## **7. Industrial Participation in the Division**

A strategic goal of the division is to improve our links to the chemical industry. Two ways to do this are through our existing sub-committees. The Division IV sub-committee on polymer structure-property relationships has an extraordinarily high level of industrial participation (over 90%). A major reason for this is that the round-robin style of data collection and sharing has an enormous benefit for industry. It is our plan to use the high industrial participation to reach out to industry and build further ties. Bob Stepto, former Division President, has been appointed to serve as a new Industrial Liaison and has attended the sub-committee meeting to make connections to industry and also visited a trade organization located in Brussels to explain the role of IUPAC to the Polymer Industry. It has been recommended that he temporarily hold his efforts because of the economy, but we expect that later this year these and other actions will serve to further engage industry in our activities. We do expect that a strong voiced interest by industry to help with our educational efforts and participate in the IYC will lead to stronger connections despite the current economic situation. We would also like to work with COCI on this topic and expect to hold discussions in Bratislava on this topic.

## **8. Educational Initiatives**

The education sub-committee, led by J.-P. Vairon, is energetically working on several activities. In addition to its web site mentioned above, in line with the strategic goals of the Polymer Division, it has a particular focus on educational activities for the developing world and especially younger scientists. It is developing links to polymer education groups across the globe. It is also a goal to use the web site to provide access to the educational material developed for IUPAC sponsored polymer division conferences. It has recently made available educational materials resulting from workshops and conferences through its web site.

As an outgrowth of this educational effort, Division IV is planning a showcase project with the IUPAC Task Group on “International Research Funding in the Chemical Sciences” to examine the possible role of IUPAC in fostering international joint research projects. Discussions were recently held in December 2008 in Washington DC and a detailed plan for a call for proposals involving researchers of 3 or more countries was discussed. It is the goal to involve researchers and students from developing countries as part of the Div. IV educational efforts. A timetable has been set and a joint project is planned in this activity. We hope to have the call for proposals in place shortly and functioning so that we can hold a symposium of all participants during IYC or shortly thereafter.

## **9. Polymer Chemistry Awards**

It has been the goal of the Polymer Division to increase its visibility to the scientific community, to increase its value to younger polymer chemists and to honour its most productive members. The division now administers the IUPAC-Samsung Young Polymer Scientist Award, the “DSM Performance Materials Award (with the cooperation of IUPAC)” and the IUPAC-Polymer International Award. Both the “DSM-IUPAC” and the “IUPAC-PI” Award were newly presented at the recent 2008 IUPAC World Polymer Congress. Division IV was directly involved in the selection of the award winners. Each award was a great success and the following polymer chemists were honoured: Craig Hawker (USA), DSM-IUPAC Award; Zhenan Bao (USA), IUPAC-PI Award; and Eric Cloutet (France), Samsung Award. Nominations for the DSM-IUPAC and the IUPAC-PI awards are underway for the 2010 World Polymer Congress.

## **10. Division Election in 2009**

The Division has just elected 2 new TMs, 6 AMs and selected 10 NRs. Michael Buback (Division Vice President) served as Chair of the Nominating Committee. Geographic consideration was a factor in the selection of the other Nominating Committee members. We are in the process of moving our elections to be in conformity with the practices of IUPAC in

general. It is the tradition of the division that all TM, AM and NR members as well as sub-committee chairs and project leaders vote in the election to provide the most democratic and transparent process possible. Each elected individual has a specific area of responsibility. The recently elected TM members are: Kubisa (Poland) and Dijkstra (Netherlands). Our elected AM members are: Berek (Slovakia), Hiorns (UK), Stejskal (Czech Republic), Smith (USA), He (China) and Mormann (Germany) and our appointed NRs are: An (China), Chen (Taipei), Kitayama (Japan), Seppälä (Finland), Galli (Italy), Moad (Australia), Singh (India) and Zigon (Slovenia).

## 11. Other Items

1. It has become an ongoing problem that the IUPAC web site is a major source of complaint. Division members are regularly frustrated by a lack of information on the web site and an inability to navigate to desired information. I am regularly writing letters explaining that we are not in complete control of the contents and this if it is searched the right way, things can be found. We completely understand that Fabienne Meyers is a captive to the web designers, but we are now in the unsatisfactory situation that the old web site is hopelessly out of date, yet the new site is not really functional. Given the likely importance of the web site to IYC activities, it would be a pity if it could not be brought up to speed or if divisions had to run their own web sites.
2. As noted above Div. IV was not in complete compliance with IUPAC election rules. It is working to fully correct that and we expect that the next election will be in complete conformity. As Division President, the fault lies with me and occurred due to a lack of understanding on my part of the rule changes.
3. The following Macromolecular Symposia volumes have been published since the last biennial report as of March 30, 2009 by Wiley – VCH in 2008 – 2009, based on presentations in the sponsored conferences.

Polymers for Advanced Applications, Macromol. Symp. vol 255, Sep 2007  
9th Annual UNESCO/IUPAC Conference on Macromolecules: Polymers for Advanced Applications, Stellenbosch, South Africa, 20–23 November 2006  
Editors: B. Klumperman and R. D. Sanderson

Functional and Biological Gels and Networks: Theory and Experiments, Macromol. Symp. vol 256, Sep 2007  
18th International Polymer Networks Group Meeting, Sheffield, UK, 3-7 September 2006  
Editors: J. Stanford

Polychar-15 World Forum on Advanced Materials, Macromol. Symp. vol 258, Nov 2007  
Polychar-15, Rio de Janeiro, Brazil, 16-20 April 2007  
Editors: M. Hess

Macromolecular Complexes, Macromol. Symp. vol 270, Aug 2008

12th IUPAC International Symposium on Macromolecular Complexes (MMC-12) was held August 27-31, 2007 in Fukuoka, Japan

Editor: Naoki Toshima

Advanced Polymer Materials for Photonics and Electronics, Macromol. Symp. vol 268, July 2008

The conference Advanced Polymer Materials for Photonics and Electronics took place in Prague, 15-19 July 2007

Editor: Vera Cimrová

Nanostructured Polymers and Polymer Nanocomposites, Macromol. Symp. vol 267, June 2008

The conference Nanostructured Polymers and Polymer Nanocomposites took place in Prague, July 2007.

Editor: Libor Matejka

POLYCHAR-16 World Forum on Advanced Materials, Macromol. Symp. vol 277, March 2009

POLYCHAR 16 was held February 17th-21st 2008 in Lucknow, India

Editor: Michael Hess

Christopher K. Ober

March 2009

## **Appendix I – Recent Division Projects**

Project No. 2008-032-1-400: Basic guidelines to polymer nomenclature

Project No. 2008-028-1-400: Elongational rheometry devices for shear rheometers

Project No. 2008-020-1-400: Revision of "IUPAC Recommendations on Macromolecular Nomenclature – Guide for Authors of Papers and Reports in Polymer Science and Technology"

Project No. 2008-015-1-400: Preferred names for polymers

Project No. 2008-022-1-400: Dispersity

Project No. 2007-058-1-400: Critically evaluated techniques for size separation characterization of starch

Project No. 2007-049-1-400: Postgraduate course in polymer science

Project No. 2007-027-1-400: International tutorial in polymer characterization - POLYCHAR 16

Project No. 2007-008-1-400: Development of a Multilingual Encyclopaedia of Polymer Terminology

Project No. 2007-004-1-400: Guidelines for shear rheometer calibration and performance check

Project No. 2007-009-1-800: Nomenclature for Rotaxane Polymers