

# IUPAC POLYMER DIVISION (DIVISION IV)

Report to Council for 2010 – 2011

## Structure of Report

1. Objective
2. Off – Year Meeting
3. Subcommittees and Responsibilities
4. Projects
5. Conferences
6. International Year of Chemistry
7. Industrial Participation in the Division
8. Educational Initiatives
9. Polymer Chemistry Awards
10. Division Election in 2011
11. Other Items

### 1. Objective

The objective of this report is to summarize activities of the Polymer Division (Division IV) for the past two years and to outline future plans. In particular, new developments in 2010-2011 up to the Bureau Meeting, August 1, 2011, San Juan, Puerto Rico will be highlighted. The division presently has six subcommittees besides the Division Committee, but we are considering changes.

### 2. Off-Year Division Committee Meeting, July 2010

The Off-Year Division Committee Meeting was held in Glasgow, Scotland, July 10-11, 2010. We had excellent representation at the meeting. In all 33 members (9 TMs, 6 AMs, 5 NRs, 12 Subcommittee Members, 4 visitors) attended the meeting. The provisional minutes are posted on the division website prior to approval at the next Division Committee meeting scheduled on July 29-30, 2011 in San Juan, .PR The 43<sup>rd</sup> World Polymer Congress (MACRO 2010, Organizer: Prof. Peter Lovell) was also held in Glasgow, 11 - 16 July 2010. As a new ongoing tradition, a symposium for young polymer scientists took place. We also presented the 3 division sponsored awards at this meeting. The WPC held biannually is the largest polymer congress in the world sponsored by Division IV. 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 (2010-2011)</b>		
1. Polymer Terminology	Chairman	R. G. Jones
2. Structure and Properties of Commercial Polymers	Co-chairmen	D. Dijkstra
3. Modeling of Polymerization, Kinetics and Processes	Chairman	G. Russell
4. Developing Polymer Materials	Chairman	J. Stejskal
5. Polymer Education	Chairman	W. Mormann J.-P. Vairon
6. Molecular Characterization of Polymers	Co-chairmen	D. Berek

All the TMs and AMs have been actively involved in the activities of the 6 Subcommittees. In addition there are small groups of Division members responsible for initial evaluation of 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 which he has continued to do.

#### **4. Projects**

Division IV remains one of the most active divisions in attracting and handling projects. Several of the projects are interdivisional, especially with Division I, II (Interdivisional Subcommittee on Materials Chemistry). and VIII. We are always willing to cooperate and looking for more opportunities. A list of the current projects is compiled by the Secretariat and is available at the IUPAC web site. Presently, 8 new projects have been initiated this biennium and along with some extensions of earlier projects and 2008 – , and 2009 – activities are ongoing (Appendix I). Extension applications, however, have been thoroughly discussed by the Subcommittees and will be covered in the Division meeting for their justification. The Chairman of each subcommittee closely monitors relevant projects including progress reports from the Task Group Leaders.

Reports on each Subcommittee's activities especially in relation to projects and subcommittee meetings can be found in the Division Meeting minutes and provisional minutes that are posted on the IUPAC web site. Minutes from the most recent division meeting at the 2010 World Polymer Congress held in Glasgow will be updated subsequent to approval during the 2011 WCC in San Juan, PR.

The Polymer Division has also carried out several volunteer activities that have not been registered as official projects that are worth noting in this report. Many of the IYC projects (collection of educational videos, educational website, essay/video contest, etc.) have not been part of a formal project. They are going well and should be a great success for IUPAC and the Division. The International Funding Call has gone from concept to executed funding program without support to the Division until recently. A new project will enable assessment by the Polymer Division of the effectiveness of the approach to international funding in this cooperative activity.

## **5. Conferences**

In the immediate past and current years, 18 sponsored conferences were or are scheduled. We expect some for this year. Just as the Torino WCC hosted the first technical sessions devoted to topics related to the Polymer Division interests, the San Juan WCC will also host two symposia organized by and related to Polymer Division topics. We are grateful to the San Juan 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 (July 2010, Glasgow. Organizer: Prof. Peter Lovell) attracted more than 1,600 participants from ~55 different countries. The IUPAC web site describing sponsored symposia lists the additional conferences sponsored by Div. IV. In addition, a series of conferences to celebrate IYC have been organized in each region of the inhabited globe. Several more conferences to be held in 2011 are in the process of being granted IUPAC sponsorship. WPC 2012 is scheduled for early July in Blacksburg, VA, USA and WPC 2014 will be hosted by Thailand.

## **6. International Year of Chemistry**

Following an organizational meeting at the World Polymer Congress in 2010, the Polymer Division selected several activities to carry out on the occasion of the International Year of Chemistry. The multi-national group included representatives of the European Polymer Federation, the Japanese Society of Polymer Science, the Korean Polymer Society, and the American Chemical Society. Key organizers for IYC actions selected at the meeting are Majda Zigon (Slovenia), Giancarlo Galli (Italy) and Christopher Ober (US). As noted above, we have been writing to companies asking for support for these activities, but to date we have not been successful. The activities selected for IYC are:

- 1) Symposia and conferences around the globe – Starting with Australia in February and

more recently in Spain this month, IUPAC sponsored conferences with sessions dedicated to younger scientists are being held in every region of the inhabited world. Current plans are to close the year with a conference in Mexico.

- 2) Video interviews with award winning polymer chemists – We have had excellent participation from the DSM-IUPAC Performance Materials Award winners as well as the Polymer International-IUPAC Award Winners in providing us with videos to post on our website. We have also added video interviews with Nobel Prize winners as well as links to short documentaries related to polymer chemistry.
- 3) A video/essay contest (A World without Polymers) – The division has received numerous entries and will announce the winners in the coming weeks. We will invite representatives of the winning essay and video teams to the World Chemical Congress.
- 4) An online, multilingual glossary of terms used in polymer chemistry – This division project is making good progress and we expect to see the online glossary completed this year. Led by Claudio dos Santos, English, Portuguese, Spanish, French will be the initial languages. This effort will grow with time.
- 5) International funding call - please see more information below. As part of the follow up to the research funding, a representative of each group will report on research accomplishments in a special symposium held at the next World Polymer Congress in 2012.

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

A strategic goal of the division remains to improve our links to the chemical industry. 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. Bob Stepto, former Division President, continues to serve as Industrial Liaison. For financial support for the IYC, we have written to companies associated with various members of the Polymer Division. Unfortunately, all of the companies had already been approached by the Secretariat and by COCI, so were uninterested in supporting new work. However, in a more recent round of mailing, contacting companies outside the normal group, we seem to be having better luck. If successful, we will forward the contact information to COCI.

## **8. Educational Initiatives**

The education sub-committee has undergone a transition in its leadership from J. - P. Vairon to Werner Mormann. We expect a seamless transition. In addition to the Polymer Education

website mentioned, the sub-committee 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.

Having this website has become very valuable and has become routinely updated. When using Google or other search engines, if “polymer education” is used as the search term, our website consistently falls among the top 1, 2 or 3. The website includes educational material including free downloads, links to education websites at international polymer societies, video interviews with scientists who have won IUPAC Polymer Division Awards as well as selected videos of Nobel Prize winners and other outstanding polymer chemists, it serves as our link for the video essay contest as well as providing information for the international funding call.

Division IV has also worked successfully with the Committee on Chemical Research Funding to carry out a pilot project on “International Research Funding in the Chemical Sciences”. Seven national funding agencies worked with us to organize a 3-country funding effort (any combination of 3 countries in this group). At the World Polymer Congress, the final panel meeting to review all proposals was held and funding decisions were made. All seven countries were represented in the final tally and approximately \$7M in funding was dispersed. We strongly recommend that this experiment be repeated in order to test our “best practice” conclusions.

## **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” Awards were again presented at the recent 2010 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: Han Meijer (NL), DSM-IUPAC Award; Molly Stevens (UK), IUPAC-PI Award; and Christopher W. Bielawski (USA), Samsung Award. Nominations for the DSM-IUPAC and the IUPAC-PI awards are underway for the 2012 World Polymer Congress. Past winners in 2008 include Craig Hawker (USA) DSM-IUPAC Award; Zhenan Bao (USA), IUPAC-PI Award and Eric Cloutet (FR), Samsung Award.

## 10. Division Election in 2011

The Division has just elected 4 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 have moved 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. Although surprisingly, IUPAC does not require this, we feel that this is an excellent way to make the elections visible to the members of Division IV. Each elected individual has a specific area of responsibility. The recently elected TM members are: Mormann (Germany), Smith (USA), Hiorns (UK) and Moad (Australia). Our elected AM members are: Lacik (Slovakia), Jones (UK), Sawamoto (Japan), Yagci (Turkey), He (China) and Zigon (Slovenia) and our appointed NRs are: Kim (Korea), Malinconico (Italy), Hoven (Thailand), Khan (Bangladesh), Manolova (Bulgaria), Margel (Israel), Mhinzi (Tanzania), Muzafarov (Russia), Sarwar (Pakistan) and Vohlidal (Czech Republic).

## 11. Other Items

1. The IUPAC website prototype is vastly improved, but implementation still has not occurred during IYC. This is a pity because we likely have had increased traffic and it could have been a showcase. There is also confusion over whether the website is internal only or can serve as a gateway for the public. My personal view is that it should do both.
2. Division IV has now fully adopted the IUPAC election rules.
3. The following *Macromolecular Symposia* volumes have been published since the last biennial report as of March 30, 2009 by Wiley – VCH in 2009 – 2010, based on presentations in the sponsored conferences. Other volumes from 2010 and 2011 are in preparation.

POLYCHAR-17 World Forum on Advanced Materials, □Macromol. Symp., 290 □April 2010  
Editors: Jean-Marc Saiter, Witold Brostow, Michael Hess

Macro- and Supramolecular Architectures and Materials, □Macromol. Symp., 287 □Feb 2010  
Editors: Helmut Ritter, Ella Bezdushna, Carsten Koopmans, Maricica Munteanu, Monir Tabatabai, Kurt E. Geckeler

Polymer Colloids: From Design to Biomedical and Industrial Applications, □Macromol. Symp., 281 □July 2009 □  
Editors: Daniel Horák, Jaroslav Kahovec, Jaromir Upárek

Polymers at Frontiers of Science and Technology - MACRO 2008, □Macromol. Symp., 279 □May 2009 □

Editors: Show-An Chen and Chain-Shu Hsu

Molecular Order and Mobility in Polymer Systems, □Macromol. Symp., 278 □April 2009  
Editor: Tatiana Birshtein □

POLYCHAR-16 World Forum on Advanced Materials, □Macromol. Symp., 277 □March  
2009  
Editor: Michael Hess

Submitted by:

Christopher K. Ober, June 2011

## Appendix I – Recent Division Projects

Project No. 2010-062-1-400: POLYCHAR Short Course on Polymer Characterization

Project No. 2010-036-1-400: List of key-words for polymer science journals

Project No. 2010-027-2-400: Critically evaluated dissociation rate coefficient for alkoxyamines -- Benchmark rate coefficients for nitroxide mediated polymerization

Project No. 2010-032-3-400: Guidelines of Multinational Calls for research cooperation and funding through national funding agencies

Project No. 2010-029-3-400: Relation between rheological properties and foam processability for polypropylene

Project No. 2010-019-1-400: Structure, Processing and Performance of Ultra-High Molecular Weight Polyethylene

Project No. 2010-007-1-400: Terminology for Chain Polymerization

Project No. 2009-050-1-400: Critically evaluated rate coefficients associated with initiation of radical polymerization

Project No. 2010-015-1-400: Postgraduate Course in Polymer Science

Project No. 2009-047-1-400: Definitions and Notations Relating to Stereochemical Aspects in Polymer Science

Project No. 2009-019-2-400: Data Treatment in SEC and Other Techniques of Polymer Characterization. Correction for Band Broadening and Other Sources of Error

Project No. 2009-015-1-400: International Tutorial in Polymer Characterization -- 18th POLYCHAR short Course

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"