

IUPAC POLYMER DIVISION MEETING 2012

The Roanoke Hotel and Conference Centre

June 22, 09.30 – 17.30

June 23, 09.30 – 12.30

Those attending: Manuel **Aguilar** (Mexico) guest, Giuseppe **Allegra** (Italy), Erkhan **Baykut** (Turkey), Markus **Behnke** (Germany, DFG) guest, Ray **Boucher** (USA, Wiley), Michael **Buback** – Division President (Germany), Claudio **dos Santos** (Brazil), Alain **Fradet** (France), Jiasong **He** (China), Michael **Hess** – Division Secretary (Germany), Roger **Hiorns** (France), Voravee **Hoven** (Thailand) guest, Jung-II **Jin** (Korea), Richard G. **Jones** (UK), Joon-Soep **Kim** (Korea) NR, Tatsuki **Kitayama** (Japan), Pavel **Kratochvíl** (Czech Republic), Igor **Lacik** (Slovakia), David **Lewis** (Australia) guest, Tim **Long** (USA), Christine **Luscombe** (USA) observer, Mario **Malinconico** (Italy) NR, Graeme **Moad** (Australia), Nicole **Moreau** – Past President IUPAC (France), Werner **Mormann** (Germany), Tamaki **Nakano** (Japan), Christopher **Ober** – Division Past President (USA), Greg **Russell** – Division Vice-President (New Zealand), Enrique **Saldívar** (Mexico) guest, Mitsuo **Sawamoto** (Japan), Carmen **Scholz** (USA) observer, Dennis **Smith** (USA), Jaroslav **Stejskal** (Czech Republic), Natalie **Stingelin** (UK) observer, Tantayanon **Supavan** (Thailand) guest, Miroslava **Trchová** (Czech Republic), Cem **Tuncel** (Turkey) guest, Richard **Turner** (USA) guest, Michel **Vert** (France), Jiri **Vohlídal** (Czech Republic), Michael **Walter** (USA) observer, Yusuf **Yagci** (Turkey), Majda **Žigon** (Slovenia)

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

Michael Buback welcomed the Division members and observers. The previously distributed meeting agenda was briefly discussed and accepted, in-process changes applied (see Appendix 1). Finally, Michael Buback asked for a moment of silence in remembrance of Rolf Bareiss (Germany), an active member of the Division and the Commission for Polymer Nomenclature for many years, who passed away unexpectedly last May.

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, San Juan, Puerto Rico, July 2011

The minutes recorded from the 2011 meeting in San Juan, Puerto Rico, were accepted with no dissenting vote.

4. Matters Arising

Michael Buback asked all members to consider candidates for new members of the Division, Subcommittees, and Working Parties and in particular to propose successors in case of retirement. There is a need for members from industry and from scientific journals. The Division should be prepared well in advance for the next elections and candidates have to be proposed to the Division Vice-President – Greg Russell. Dick Dijkstra (Modelling, Polymerization Kinetics and Processes) and Przemyslaw Kubisa (Conferences) will not run again next time. For the list of members and their eligibility see Appendix 2.

The projects have to be reviewed, old projects (those to be terminated in 2011) cleared up and finalized. Suggestions for possible extensions of projects that are not too old should be submitted to Michael Buback (through the responsible Subcommittee chair) for further consideration by the end of 2012. While old projects have to be terminated, new projects need to be created although the budget situation is still tight, about 2/3 of the budget is spent for meetings. The present budget situation of the individual projects and their expiration date are in Appendix 3.

For the Poster Prizes that are granted at the MACRO 2012 in Blacksburg, Virginia, referees are required and those who volunteer to assist in judging the posters are asked to identify themselves to Greg Russell.

5. Report Interdivisional Subcommittee Materials Chemistry (ISMC) (Chris Ober)

Division I (Physical & Biophysical), Division II (Inorganic), and Division IV (Polymer) are involved. Not much of a progress can be reported since there is no additional budget granted for this Subcommittee parallel to the activities of Polymer Division (Conferences and Tutorials) in this field. Activities in Materials Science should be reported to Chris Ober. The next meeting of the ISMC is scheduled for September 2012 in Duesseldorf, Germany. Jung-II Jin adds that Division II tried to establish a Materials Division in the past but failed, so that the ISMC can be assumed to carry on as such for some time.

6. Report Subcommittee Polymer Terminology (SPT) (Dick Jones)

Cooperation with Division VIII

The traditionally good communication between Division IV, represented by SPT, and Division VIII has recently given cause for concern through the unauthorised circulation of a document of SPT reserved business for consideration by the membership of Division VIII, the president of which had declared subsequently that they would advise changes as they see fit. This had happened without informing either the SPT chair or secretary. The SPT chair, Dick Jones, had made clear his strong objections to any interference in our reserved business by any

other IUPAC committee or subcommittee.

Dick Jones also made clear that there was a long-standing agreement between Divisions IV & VIII that all polymer nomenclature projects are progressed within SPT, the reason being that polymer structural variation has many idiosyncrasies without parallels in inorganic and organic nomenclature. The depth of expertise that properly addresses these matters is found only in SPT as the successor to the former Commission on Macromolecular Nomenclature. It is expected that Division VIII is kept properly informed of progress by those members of the SPT who are also members of Division VIII. In addition, completed projects are circulated for final consideration by the members of Division VIII as they are to the entire membership of SPT before submission for public review and subsequent publication. So there should be no reason for any real concern. The SPT will resist any attempt to take control of polymer nomenclature away from SPT. The arrangement mentioned above had served well since the abolition of commissions and continues to do so; selective SPT/Division VIII common membership should be maintained and any attempt to remove polymer nomenclature work from the Polymer Division should be vetoed.

Publications since the San Juan meeting

2003-019-2-400: Definitions of terms relating to crystalline polymers - revision of IUPAC Recommendations 1988 – Allegra and Meille, *Pure Appl. Chem.*, 2011, Vol. 83, No. 10, pp. 1831-1871

2002-017-1-400: Polymerization Processes and Polymers in Dispersed Systems – Slomkowski, *Pure Appl. Chem.*, 2011, Vol. 83, No. 12, pp. 2229-2259;

2004-043-1-400: Terminology relevant to bio-related polymer science and applications – Vert, *Pure Appl. Chem.*, 2012, Vol. 84, No. 2, pp. 377-410

Projects submitted for public review

2005-043-2-400 *Self-Assembly and Aggregation in Polymers* - Ober, Jones

2006-041-1-400 *Glossary of Thermal and Thermomechanical Properties of Polymers* - Hess

2008-032-1-400 *Basic Guidelines to Polymer Nomenclature* – Hiorns

Work in progress

1999-051-1-800 *Source Based Nomenclature for Modified Polymer Molecules* - Kitayama

2003-042-1-800 *Revision of Source-Based Nomenclature of Homopolymers & Copolymers* – Kitayama

2003-060-2-400 *Terminology on Separation of Macromolecules* – Chang

2005-005-2-400 + Supplement 2011-033-1-400: Definitions of Terms Relating to Individual Macromolecules, Macromolecular Assemblies, Polymer Solutions and Amorphous Bulk Polymers - Stepto.

2006-004-1-400 *Abbreviations* - He

2006-028-1-400 *Terminology for Conducting, Electroactive and Field-responsive Polymers* - Vohlídal

2007-008-1-400 *Multilingual Encyclopedia* – dos Santos

2008-015-1-400 *Preferred names of Polymers* - Mormann

2008-020-1-400 *Revision of the Division IV web-based Terminology Guidelines* – Hodge

2009-047-1-400 *Stereochemical Aspects in Polymer Science* – Hellwich & Moad

2010-007-1-400 *Terminology for Chain Polymerization* – Moad

2010-036-1-400 *List of Key Words* – Kubisa/dos Santos

New projects since the San Juan meeting

2011-033-1-400 *Extension to 2005-005-2-400 Terminology Properties of Macromolecules in Solution* – Chang & Stepto

2011-035-1-800 *Terminology & Nomenclature of Inorganic & Coordination Polymers* – Jones

2011-013-2-400 *Updating Wikipedia: Synchronizing Polymer Definitions and Terminology* - Hess

2012-001-1-400 *Terminology of Nanomaterials and Nanotechnology in Polymer Science* – Ober & Jones

Feasibility studies

A Brief Guide to Polymer Terminology (Brief Terms) – Hiorns, Vohlídal

Terminology for the Modelling and simulation of polymers – Meille

IUPAC Certification Standards for Polymer Science Journals (IQPAC) – Hiorns

Michel Vert has announced the idea of a new project called: *Lactic acid-based polymers* and he will soon distribute corresponding information within SPT.

7. Report Subcommittee Structure and Properties of Commercial Polymers (Jiasong He)

The Subcommittee is chaired by Dick Dijkstra (Germany), Jiasong He (China) and the Chairman of the East Asian Meeting of the Subcommittee, Toshikatzu Takigawa (Japan). Presently there are 66 active members (30 from industry, 36 from academia) mostly from Asia and Europe. Two meetings were held since the last report (GA Puerto Rico): 26th East Asia Research Meeting (Subcommittee meeting Nr. 69A), Kunming, China, 20.08.2011, 16 participants (4 industry, 12 academia) from 3 countries, and Subcommittee meeting Nr. 70 in Hamburg, Germany (hosted by Beiersdorf), 02.-04.04.2012, 16 participants from 7 countries (8 industry, 8 academia).

Presently, there are 4 **completed projects**, namely:

1999-039-1-400 Structure and properties of cyclic olefin copolymers

Task Group Leader: Prof. Kim, KAIST, Korea

002-052-1-2400 Structure and properties of polyester elastomers composed of poly(butylene terephthalate) and poly(ϵ -caprolactone)

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

2003-051-1-400 Structure and properties of polymer/clay nanocomposite

Task Group Leader: Prof. S.C. Kim, KAIST, Korea

2004-044-2-400 Microstructure and Properties of Thermotropic Liquid Crystalline Polymer Blends and Composites

Task Group Leader: Prof. Jiasong He, Institute of Chemistry, CAS

Publications:

M. Md. Ali, S. Nobukawa, M. Yamaguchi*

Morphology development of polytetrafluoroethylene in a polypropylene melt.

Pure Appl. Chem., 2011, 83(10), 1819

Q. Mi, X. Zhang, J. He*,

Rheological hybrid effect in dually filled polycarbonate melt containing liquid crystalline polymer.

Polym. Eng. Sci., 2012, 52(2), 289

Currently 7 active projects:

2010-029-3-400 Relation between rheological properties and foam processability for polypropylene

Task group leader: Prof. M. Yamaguchi, Japan Advanced Institute of Science and Technology, Japan

2010-019-1-400 Characterization, rheology and mechanical properties of high and ultra-high molecular weight polyethylene

Task Group Leader: Prof. Clive Bucknall, Cranfield University, United Kingdom

The project is within schedule and makes good progress.

2008-028-1-400 Elongational rheometry devices for shear rheometers

Task Group Leader: Dr. Dietmar Auhl, POLY-Unité de chimie et de Physique des hauts polymères, Belgium

Some results are still missing, manuscript in preparation: guidelines of best practice.

2007-004-1-400 Guidelines for shear rheometer calibration and performance check

Task Group Leader: Dr. Maximilian Ruellmann, BASF, Germany

Publication in preparation.

2005-023-2-400 Microstructural, melt processing and mechanical properties of compatibilized PA6/ABS Blends

Task Group Leader: Dr. Helge Steininger, BASF Aktiengesellschaft, Germany

Manuscript submitted to J. Polym. Sci.

2003-009-1-400 Recommendations for data presentation applicable to mechanical and rheological measurements of polymers.

Task Group Leader: Dr. Erik Wassner, BASF SE, Germany

Project completed, TA-Instruments has implemented results in software, a summary is being written.

1999-020-1-400 Quantifying scratch resistance of commercial polymers.

Task Group Leader: Dr. Rob Bailey, ICI Measurement Science Group, United Kingdom

Project completed, a publication is being written.

New and running Feasibility Studies:

Rheology of foaming

Participants: Wassner, Mangus, Auhl, Dijkstra, Handge

The MultiPass rheometers at BASF and DOW, intended for use in this project, are associated with , so proper measurement equipment is not available. It is decided to make this a dormant idea.

Comparison of different CABER devices

Participants: Wassner, Dijkstra, Mangus, Brummer, Clasen, Zoetelief

Status not much change since last year: CABER devices are available at the labs of Bayer, BASF, Beiersdorf and KU Leuven. DSM can contribute to numerical simulations if necessary. Participants should discuss how to proceed.

Comparison between experiment and simulation of extrudate swell

Participants: Mangnus, Auhl, Vittorias, Handge, Kroll, Zoetelief, Remerie, Slouf

The objective is to develop a representative methodology to measure extrudate swell for polymer melts. Remerie and Slouf expressed their interest. It is decided to propose a new date (and venue) for organizing a workshop to discuss the project in more detail.

Feasibility study No. 17

Mechanical and rheological studies during drying of a disperse system

Participants: Dijkstra, Slouf, Auhl

There are still interested members: Slouf (wet SEM), Auhl, Nowak and Clasen (high freq. techniques for open systems in the group of Vermant, KU Leuven). It has been decided that samples will be selected and distributed (Dijkstra and Auhl) amongst the interested members. With this it has become a Feasibility Study.

Interfacial and adhesive properties of polyamide elastomers

Participants: Maeda, Y. Men, C.Y. Liu, S.H. Kim

This Feasibility Study has been proposed on the EA-meeting by Dr. Maeda of Ube Industries. The project is split into 2 parts: the characterization of PAE's and the heat-welding properties. Samples are being prepared and, when ready, will be distributed amongst the participants. From EU, the following members have shown interest: Dijkstra (pendant drop method), Slouf (should check within group), Auhl (need to check interest within group as well).

Continuous fibre composites containing Carbon NanoTubes (CNT)

Morphology induced structure formation determined by LAOS (FT-rheology)

Implementation of new techniques in the (industrial) materials research

Comparison of modulated DSC, Flash DSC and TOPEM

Further actions

For each new feasibility study, new potential contributors will be named or contacted.

Web page will be updated; Presented graphs will be up-loaded to the web site.

Projects on the website will be updated by Task group leaders.

2012 Subcommittee EA Meeting No. 70A

November 22-23, Jeju, Korea

2013 WP/SC 50-year anniversary

Special Subcommittee meeting No. 70

including retired members, half-day symposium, special banquet dinner

Prof. Clive Bucknall and Dr. Martin Laun

London, UK

End of March/begin of April

It was observed that some of the projects have a strong impact on standardization and there was the question whether contacts exist to ASTM and ISO. The answer was that there are official contacts. It was suggested that official contacts should be established, and Jung-Il Jin observed that in the past there had been a link to ISO that should be revitalized.

8. Trends in Polymer Science (Yusuf Yagci)

Yusuf Yagci gave an overview of the publication activities in the field of polymer science in recent years, i.e. 2008-2012. The data for 2012 only cover the first 6 months of the year, see fig. 1. The number of publications in Polymer Science is still increasing at a level of about 17,000 at the moment. Leading countries (in decreasing order) in terms of the number of publications are the PR China, USA, Japan, Germany, South Korea, India, France, UK, and Canada.

The distribution of publications over the Journals is shown in fig. 2, with J. Appl. Polym. Sci. leading far ahead.

Fig. 3 reveals a picture of the activities in different field of Polymer Science at the present time.

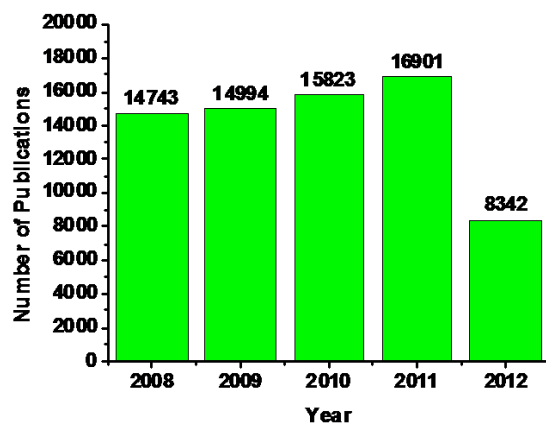


Fig. 1: Number of publications in Polymer Science, data from ISI-WOS, 10 June 2012.

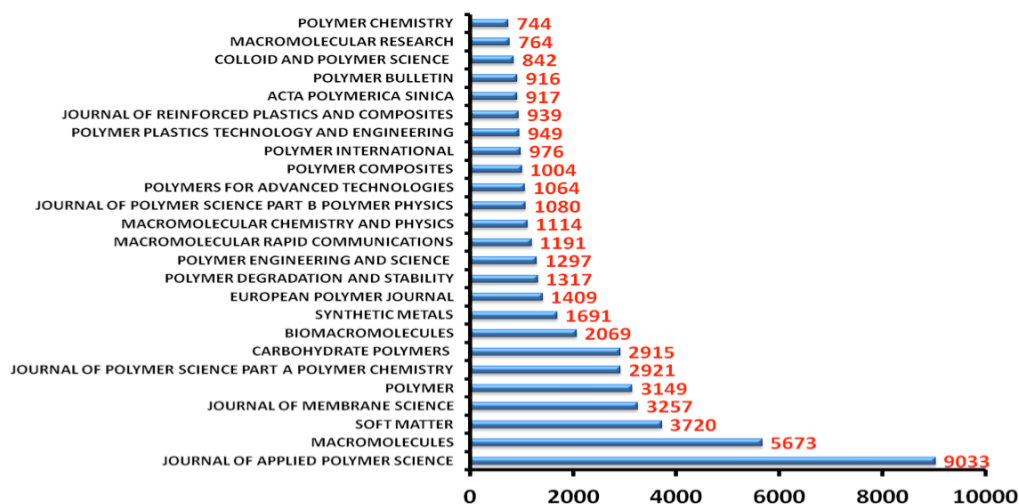


Fig. 2: Distribution of publications in Polymer Science over the journals, data from ISI-WOS, 10 June 2012.

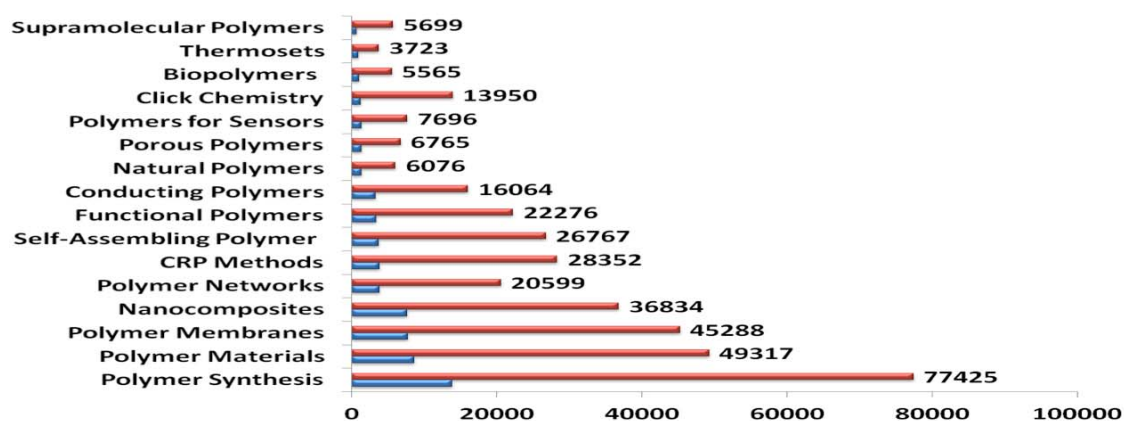


Fig. 3: The most active fields in Polymer Science, data from ISI-WOS, 10 June 2012. Blue bars the year 2012.

The actual trends in Polymer Science are also reflected by the topics that are presently in the focus of MACRO 2014:

- Polymer Chemistry
- Polymer Physics
- Polymer Processing
- Nanostructured Polymeric Materials
- Advances in Bio-Related Polymers
- Polymers in Optics, Electronics, and Opto-Electronics
- Environmentally Benign Polymers
- Polymer Membranes
- Polymer Education
- Performance Materials
- Young Polymer Scientists

Particularly active are the following sub-areas, as reflected by the total number of publications (green) and citations (red) 2008-2012 (June), see fig. 4-12:

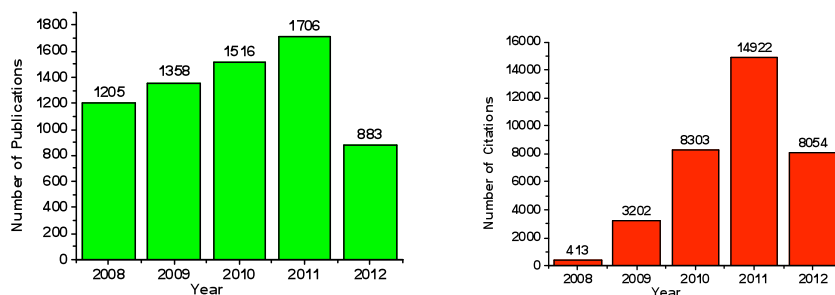


Fig. 4: **Nanocomposites** with a total number of 6670 publications (left, green) and 34834 citations (right, red).

The most important filler in nanocomposites is still clay, followed by nanotubes. Graphene is still a minor component with presently only 2.23 % but of growing importance, see fig. 5.

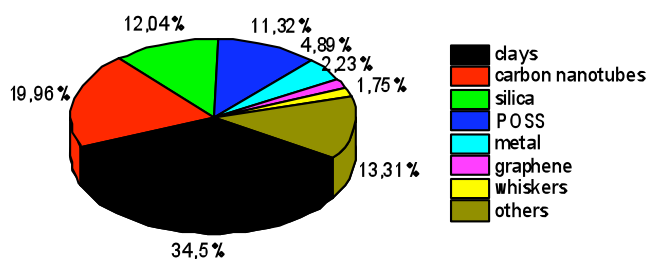


Fig. 5: Application of the different filler components in nanocomposites.

The number of publications in the field of polymer membranes is now almost constant at a level of about 1,000 per year but with a rapidly increasing number of citations, see fig. 6.

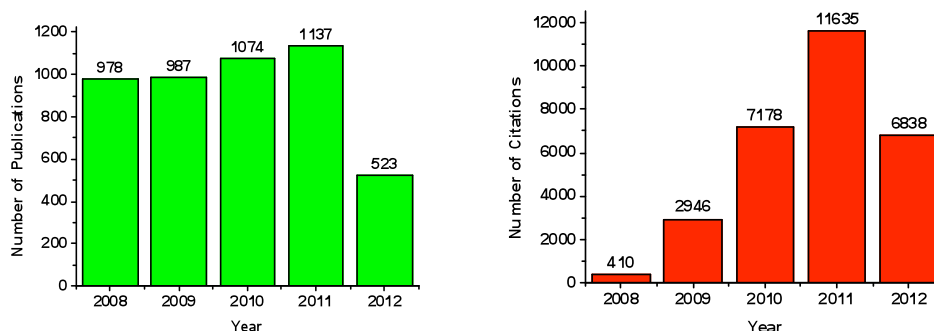


Fig. 6.: **Polymer Membranes** with a total of 4,700 publications since 2008 and 29,000 citations with only the first half of the year 2012.

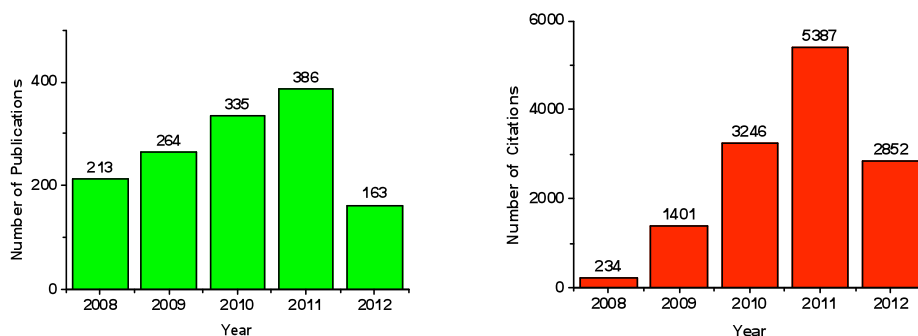


Fig. 7: **Stimuli Responsive Polymers** with a total of 1.361 publications since 2008 and 13120 citations with

only the first half of the year 2012.

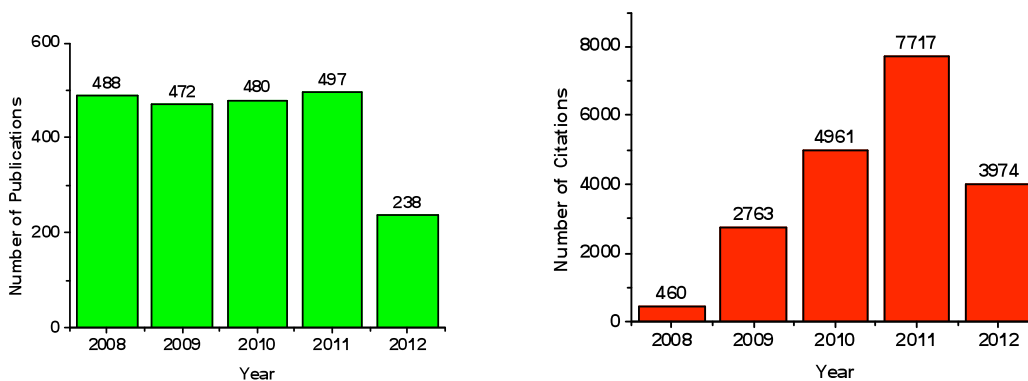


Fig. 8: **Controlled Radical Polymerisation** with a total of 2,200 publications since 2008 and 19,875 citations with only the first half of the year 2012.

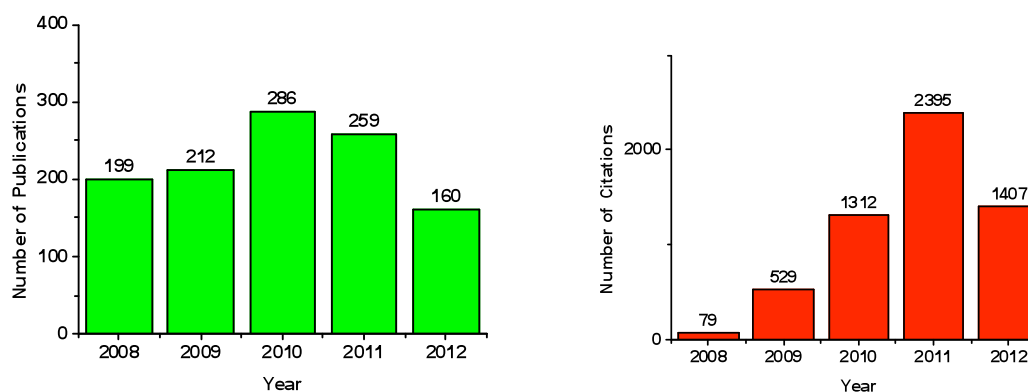


Fig. 9: **Biopolymers** with 116 publications since 2008 and 5,722 citations with only the first half of the year 2012.

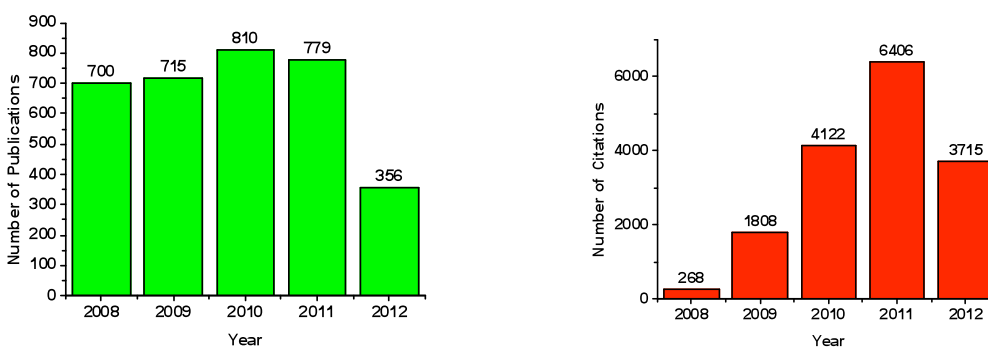


Fig. 10: **Conducting Polymers**, with 3,360 publications since 2008 and 16,319 citations with only the first half of the year 2012.

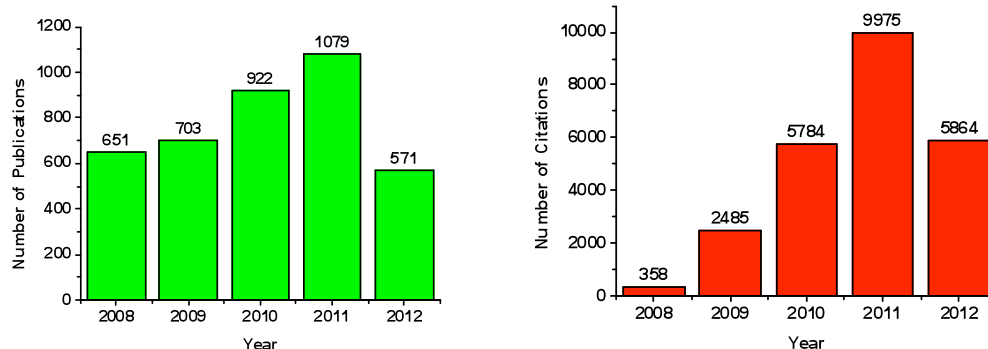


Fig. 11: **Drug Delivery** with 3926 publications since 2008 and 24,466 citations with only the first half of the year 2012.

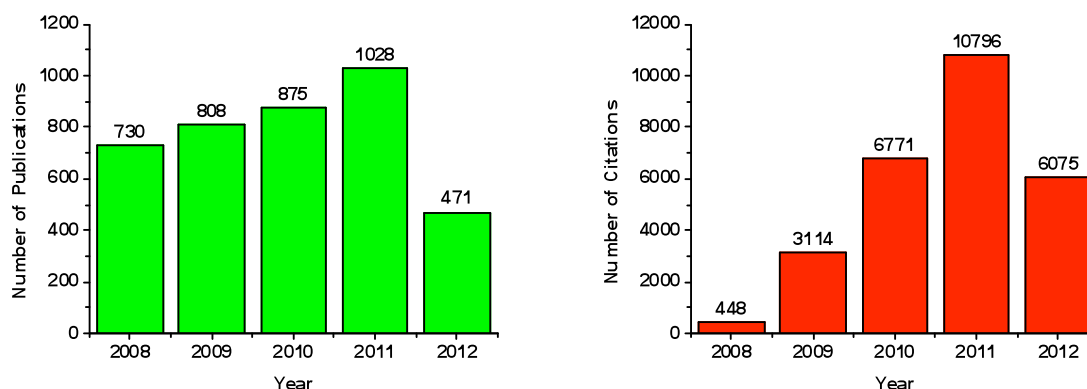


Fig. 12: **Self-Assembling Polymers** with 3,926 publications since 2008 and 24,466 citations with only the first half of the year 2012.

Pavel Kratochvil suggested to add these statistics to the Division website with a regular up-date and feedback is requested of what exactly should be covered. It was observed that the statistics give a good picture of the ups and downs in the development of certain fields of polymer science. These statistics, however, are not corrected for self-citation and we do not know which keywords were selected. The rate of increase/decrease of activities should be monitored and the Polymer Division should contribute with further ideas to make a better evaluation of the activities in Polymer Science in order to identify certain developments in an early stage.

9. Report of the subcommittee on Modelling of Polymerization Kinetics and Processes (Greg Russell)

Greg Russell has passed on his chairmanship to Robin A. Hutchinson (Kingston, Canada) and Sabine Beuermann (Clausthal, Germany) since he became Vice-President of the Polymer Division. Hutchinson and Beuermann share chairmanship and secretary's job of the Subcommittee. Unfortunately none of them were able to attend the Roanoke Meeting of the Division. The last meetings of the Subcommittee were during PACIFICHEM December 17-19, 2010, Honolulu (USA) and the 242nd ACS-Meeting August 29, 2011, held in Denver, USA. The minutes of all meetings since 2006 are available as pdf-file on the website.

There are presently 42 active members from 13 countries (industry 4, research institutes 4, universities 34). Since the last meeting one member retired from the group while 4 new members were recruited. Some countries have a strong representation while other important countries or even continents are only weakly or not represented, e.g. the USA, UK and many Asian countries. Consequently, new members – in particular from industry – are very welcome. Jung-II Jin strongly encouraged activities to recruit members from underrepresented countries.

The Subcommittee is active in critically evaluating kinetic parameters of polymerization processes and establishing reliable methodologies. While propagation rate coefficients have been determined for many methacrylates, butyl acrylate, methacrylic acid and vinyl pivalate the activities are now extended to the determination of termination rate constants, initiation rate parameters, RAFT¹ and NMP² polymerization kinetics. In detail there are the following projects:

¹ RAFT = **R**eversible **A**ddition-**F**ragmentation (Chain-) **T**ransfer Polymerization

² NMP = **N**itroxide-**M**ediated Polymerization

Project 2000 – 028 – 1 – 400

Critically evaluated termination rate coefficients for free-radical polymerization. 1. Current status, evaluation of experimental methods, data for styrene and methyl methacrylate. The third publication is being finalized and a fourth one on methyl methacrylate is being planned.

Project 2004 – 034 – 1 – 400

Critically evaluated propagation rate coefficients for free-radical polymerization of water-soluble monomers polymerized in the aqueous phase. The second publication dealing with precision of SEC for poly(acrylic acid) and poly(methacrylic acid) is currently in preparation.

Project 2004 – 040 – 1 – 400

Towards a holistic mechanistic model for reversible addition-fragmentation chain transfer (RAFT) polymerizations: Dithiobenzoates as mediating agents. Graeme Moad is going to write a comment for *Macromol. Rapid Commun.* on the current situation of RAFT retardation. This paper completes the project.

Project 2009 – 050 – 1 – 400 (cont.)

Propagation and termination of radical polymerization. Graeme Moad is in charge of writing the first publication on azo-initiators.

Project 2010 – 027 – 1 – 400 (cont.)

Determination of rate constants in reversible-deactivation radical polymerization. Currently data from TEMPO³ and SG1⁴ are being measured

New Project 2010 – 007 – 1 – 400

Terminology for chain polymerization.

New Project 2009 – 050 – 1 – 400

Critically evaluated rate coefficients associated with initiation of radical polymerization.

New Project 2010 – 027 – 2 – 400

Critically evaluated dissociation rate coefficients for alkoxyamines.

New Project 2011 – 034 – 2 – 400

Critically evaluated rate coefficients for (methyl) acrylate propagation.

New Projects – Following Currently Concluding Projects

Critically evaluated rate coefficients for chain-length-dependent termination.

Future Project Ideas

Critically evaluated **termination rate coefficients** as a function of **conversion**

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 rate coefficients for **ionic polymerizations**

ATRP: current situation on mechanisms; benchmark rate coefficients

Set of benchmark rate coefficients for a **particular monomer**

Citations of Publications (6 July 2010 → 22 June 2012)

Consistent values of rate parameters in free radical polymerization systems	155 → 160 citations.
Part II: Outstanding dilemmas and recommendations	184 → 190 citations
Consistent values of rate parameters in free-radical polymerization systems.	27 → 31 citations
Critically evaluated rate coefficients for free-radical polymerization, 1. Propagation rate coefficients for styrene	444 → 487 citations
Critically evaluated rate coefficients for free-radical polymerization, 2. Propagation rate coefficients for methyl methacrylate	336 → 364 citations
Critically evaluated rate coefficients for free-radical polymerization - 3. Propagation rate coefficients for alkyl methacrylates	123 → 138 citations
Critically evaluated rate coefficients for free-radical polymerization, 4. Propagation rate coefficients for methacrylates with cyclic ester groups	43 → 52 citations
Critically evaluated rate coefficients for free-radical polymerization, 5. Propagation rate coefficient for butyl acrylate	114 → 145 citations
Critically evaluated rate coefficients for free-radical polymerization, Part 6.	

³ TEMPO = 2,2,6,6-tetramethyl-1-piperidinyloxy radical

⁴ SG1 = N-tert-butyl-N-(1-diethylphosphono-2,2-dimethylpropyl) nitroxide

Propagation rate coefficient of methacrylic acid in aqueous solution	18 → 24 citations
Determination of the Propagation Rate Coefficient of Vinyl Pivalate based on EPR Quantification of Propagating Radical Concentration	1 → 1 citation
Critically-evaluated propagation rate coefficients in free radical polymerizations. 1. Styrene and methyl methacrylate	96 → 101 citations
Critically evaluated termination rate coefficients for free-radical polymerization – 1. The current situation	86 → 102 citations
Critically evaluated termination rate coefficients for free-radical polymerization, 2. Experimental methods	56 → 66 citations
Mechanism and Kinetics of Dithiobenzoate-Mediated RAFT Polymerization, 1. The Current Situation	166 → 224 citations
Terminology for reversible-deactivation radical polymerization previously called “controlled” radical or “living” radical polymerization	1 → 38 citations

Michael Buback pointed out that after putting together several ‘dilemma papers’ there is now the need to prepare publications that deal with the solution of those dilemmas and he suggested to check the list of papers accordingly.

10. Report Sub-Committee on Polymer Education (SPed) (Werner Mormann) **Educational Courses, Workshops and Conferences**

Project #2011-052-1-400 16th UNESCO/IUPAC Postgraduate Course in Polymer Science 2011/2012
(Prague)

Pavel Kratochvil

Objective: To enable young university graduates and PhDs from countries with limited research facilities to acquire knowledge on recent advances in polymer science and professional skills needed for promotion of polymer science in their home countries. Details at <www.imc.cas.cz/en/umch/kursy_unesco_iupac.htm>

Ten students from China, Poland, Russia, Ukraine, Uruguay, Vietnam.

March 2012: mid-term seminar; students reported on the progress of their research projects.

17th UNESCO/IUPAC Course 2012-13 starting October 1, 2012:

18 research projects have been offered.

Cumulative results of the 16 runs:

graduates: **130** from **20** countries, publications in international journals: **208**,
communications at international meetings: **327**, citations: **3427**.

POLYCHAR 20 (20th World Forum on Advanced Materials- IUPAC Conference and Short Course on Polymer Characterization) March 26-30th, 2012, Dubrovnik, Croatia <http://www.polychar20-croatia.com>

Michael Hess, Vera Kovačević

POLYCHAR 20 Conference was sponsored with **general IUPAC funds** USD 5,000 (Program for Conferences in Scientifically Emerging Regions).

Short Course sponsored by IUPAC Polymer Division with USD 2,000 (support of 14 students/young scientists).

Participants (Short Course): about 90, mostly students and researchers from academia.

The content of the Short Course (1-day tutorial) comprised the following topics presented by the lecturers listed below:

Positron Annihilation of Polymers	F. Maurer, Lund, Sweden
Tribology and Brittleness	W. Brostow, Denton, USA
Dynamic-Mechanical and Calorimetric Analysis of Polymers	M. Hess, Gwangju, South Korea
Molecular Dynamics Around the Glass Transition of Complex Systems	J.-M. Saiter, Rouen, France
Electron Microscopy of Polymers – Technique and Examples	S. Henning, Halle, Germany
Molecular Characterization of Synthetic Polymers with Liquid Chromatography and Related Methods	D. Berek, Bratislava, Slovakia
Modern Microscopic Methods – Local Properties Mapping by Atomic Force Microscopy	H. Schönherr, Siegen, Germany
X-Ray Diffraction of Polymers	I. Smit, Zagreb, Croatia
Electrical Properties of Polymers and Polymer Composites	T. Zaharescu, Bucharest, Romania

Polymer Education Symposia at the IUPAC World Polymer Congress 2012 in Blacksburg, Virginia. **Werner Mormann**

Symposium chair: David Schiraldi, Case Western University.

Intention was to have 2 sessions + round table; Despite of early contact with Tim Long and Dave Schiraldi, SPed had no chance to influence the selection of speakers or topics.

If IUPAC Polymer Education sessions organized by Polymer Division (SPed) are to be continued on future Macro conferences, Polymer Division should enforce a leading role (session organization) of SPed, once a Macro conference is given to a country (organization). Chris Ober explained why SPed had no stronger influence in this Macro meeting. He will talk to Michael Buback about this.

The announced Session Program reads:

Wednesday Morning

- I) **Symposium Advances in Interdisciplinary Interaction** (D. Schiraldi)
- 10:30 Welcome Address
- 10:40 M. Sawamoto, Polymer Education in Japan for Innovation
- 11:15 A.R.Khoklov, Education in Polymer Science as Part of Soft Matter Nano-Curriculum
- II) **Symposium Advances in Interdisciplinary Interaction**
- 01:45 R.Y.Lochhead, Polymer Science & Engineering at the University of Southern Mississippi
- 02:05 D.A.Schiraldi, Modular, Half-Semester Graduate Curriculum in Polymers
- 02:25 L.J. Mathias, Polymer Education in 2012: Where we are, where we are going
- 02:45 C.A.Helfer, Polymer Education for Middle School Students
- 03:05 P.Bligh-Glover, Changing Lives: The CLiPS Polymer Envoys Program for High School Students
- 03:25 Break
- 03:40 L.Dai, Controlled Fabrication of Polymer Nanocomposites for Multifunctional Applications
- 04:00 K.J.Edgar, Rational Design of Polysaccharides for Drug Delivery
- 04:20 S.Kumar, High Performance Fibres: Past, Present, and Future
- 04:40 J. Riffle, Tutorial: Chemistry and Properties of Polymeric Biomaterials, Polyethers, Polyesters, and Polyanhydrides

Yussuf Yagci suggested nominating a member of the SPed as Session Chair of a World Polymer Congress (WPC). Michael Buback agreed and made the argument that otherwise the influence on the Conference organization would be minimal. The Division President or Vice-President should establish contact to the organizers of a WPCs and discuss these matters. Jung-Il Jin pointed out that every single WPC in the past has had an educational section and that this tradition should be carried on with impact and leadership by SPed.

Polymer Education Website

Chris Ober

A project on the PolyEdu website is in the process of evaluation. The project involves monitoring hits of the *website* and hence identifies the activities that cause most people's curiosity taking advantage of Google analytics to monitor the traffic of the page. During IYC the traffic on the competition page was quite high. Now, the major item that draws attention to the website is 'what is a polymer'. Very modest traffic (almost none) to the CD that is distributed; perhaps we should advertise this more and advertize the website more efficiently.

Pavel Kratochvil suggested the website to follow the layout of the IUPAC website. Chris Ober gave a feedback about updating the IUPAC website page.

IUPAC Terminology and Nomenclature

The intention is the Revision of textbook manuscript by IUPAC SPT experts to implement IUPAC Terminology and Nomenclature. Textbooks with this revision should obtain an IUPAC label like: "Terminology and Nomenclature IUPAC approved" or "Textbook following IUPAC recommendations for polymer terminology terminology and nomenclature"

Benefits for Publisher: Correct IUPAC terminology; Promotion of textbook through IUPAC label

Benefits for IUPAC (Polymer Division): Increased awareness of IUPAC; Promotion of polymer terminology and nomenclature; financial contribution of publishers covering the associated costs should be considered in Polymer Science Textbooks.

Actions taken:

- C. Ober has sent a letter to several publishers.
- C. Ober has been in contact with Wiley VCH
- W. Mormann has contacted Wiley VCH

Results:

Wiley-VCH asked to send them copies of relevant documents, which were to be distributed to new or revising

authors. The idea of revision was refused for legal and copyright reasons. Names of authors preparing a revision will not be revealed (perhaps in order to not decrease the sales of the running edition).

Outcome of Roanoke meeting discussion:

Approach an author of a textbook preparing a new edition and offer the "IUPAC service" on a personal basis with the aim to offer for the printed version "IUPAC approval". Dick Jones to approach Ian Cowie (author of "Polymers: chemistry and physics of modern materials") on behalf of this idea.

IUPAC Transnational/Transcontinental Call for Proposals in Polymer Chemistry

<http://www.iupac.org/polyedu/DivIVCall/page6/page7/page7.html>

Seven proposals were funded with a total of 25 research teams. Mid-term presentations are scheduled for IUPAC World Polymer Conference Macro 2012, Blacksburg VA. *Virginia Tech Torgersen 1040 Tri-National Award Session*. Final reports are envisaged for a special workshop at IUPAC Macro 2014.

Administrative work for IUPAC:

'Guidelines of multinational Calls for research cooperation and funding through national funding agencies' (Task leader: **W. Mormann**). Project funded by IUPAC.

A follow-up call is being considered: **International Call for Proposals in Sustainable Chemistry**.

Current situation of SPEd

Werner Mormann described the current situation of SPEd as being not satisfying. After "foundation" the chair was an AM, who became TM (Jean-Pierre Vairon) with an Associate member as substitute and potential successor (Werner Mormann). When WM became chair and Titular member (2012/13 term) no AM was assigned to SPEd. For continuity in the Subcommittee there should be a member (substitute or secretary) working closely with the Subcommittee chair who would be the natural choice to succeed the Chair. WM recommends to POLYMER DIVISION to ensure the leading role of SPEd for education sessions on future IUPAC POLYMER WORLD CONGRESS events, to find a new SPEd- chair for 2013 after Istanbul (TM from 2014), and to go back to the situation before 2012 with a TM and an AM in the subcommittee to ensure continuity.

11. Conferences (Michael Buback in proxy of Przemyslaw Kubisa)

General information about Conference Sponsorship

The granting of sponsorship by IUPAC is judged on the following criteria: scientific quality, significance of conference, suitability of conference, evidence of sufficient advanced planning, suitable time spacing of conferences of a similar type, rotation of leadership for conferences in a series or of a similar type, geographically diverse International Advisory Board, participation of industrial chemists and women as speakers and as members of the International Advisory Board. In general, IUPAC sponsorship of a conference or symposium attests to its quality but does not provide financial support. However, Divisions and Standing Committees of IUPAC may apply for financial support for Conferences via two programs: *-New Directions in Chemistry* and *-Scientifically Emerging Regions*. For details see:

<http://www.iupac.org/home/conferences/application-for-sponsorship.html>

IUPAC Polymer Division Sponsored Conferences - 2010 (8 conferences)

- 18th International Conference on Polymer Characterization, Polychar, Siegen, Germany, April 7, 2010
- 8th International Conference on Polymer-Solvent Complexes and Intercalates, Strasbourg, France July 5, 2010
- 43rd International Symposium on Macromolecules – IUPAC World Polymer Congress 2010, Glasgow, UK, July 11, 2010
- 74th Prague Meeting on Macromolecules. Contemporary Ways to Tailor-Made Polymers. Modern Methods of Polymer Synthesis. Prague, Czech R. July 18, 2010
- MAM-10. 5th International Symposium on Macro- and Supramolecular Architectures and Materials: New Science and Technologies for the Improvement of Human Living Standards.
- Montego Bay, Jamaica, August 15 2010
- 4th International Conference on Polymer Behavior, Lodz, Poland, September 20, 2010
- 6th International Symposium on Novel Materials and their Synthesis, Wuhan, China, October 11, 2010
- 8th Hellenic Society Symposium on Polymer Science and Technology, Hersonissos, Greece, October 24, 2010

IUPAC Polymer Division Sponsored Conferences - 2011 (13 conferences)

- Conference: 32nd Australasian Polymer Symposium, February 13-16, 2011, Coffs Harbour, Australia
- Conference: 19th International Conference on Polymer Characterization: World Forum on Advanced Materials, March 20-24, 2011, Katmandu, Nepal
- Conference: International Symposium on Materials Education, March 26-28, 2011, Pune, India
- Conference: 11th UNESCO/IUPAC Workshop and Conference on Functional Polymeric Materials and Composites, April 26-29, 2011, Stellenbosch - South Africa
- Conference: 2nd Federation of Asian Polymer Societies Congress, May 8-11, 2011, Beijing, China
- Conference: 11th International Conference on Frontiers of Polymers and Advanced Materials, May 23-27, 2011, Pretoria, South Africa
- Conference: 7th International Symposium on Molecular Mobility and Order in Polymer Systems, June 6-10, 2011, Saint Petersburg, Russia
- Conference: European Polymer Congress 2011, June 26 – July 1, 2011, Granada, Spain
- Conference: International Symposium on Ionic Polymerization, July 10-15, 2011, Akron - United States
- Conference: 75th Prague Meeting on Macromolecules: Conducting Polymers, July 10-14, 2011, Prague, Czech Republic
- Conference: 14th International Symposium on Macromolecular Complexes, August 14-17, 2011, Helsinki, Finland
- Conference: 9th International Conference on Advanced Polymers via Macromolecular Engineering, September 5-8, 2011, Cappadocia, Turkey
- Conference: 7th International Symposium on Novel Materials and their Synthesis, October 11-14, 2011, Shanghai, China, July 10-15

IUPAC Polymer Division Sponsored Conferences – 2012 (8 conferences)

- Conference: 14th International IUPAC Conference on Polymers and Organic Chemistry January 6-9, 2012, Doha, Qatar
- Conference: 33rd Australasian Polymer Symposium, February 12-15, 2012, Hobart – Australia
- Conference: 20th International Conference on Polymer Characterization – World Forum on Advanced Materials, March 26-30, 2012, Dubrovnik – Croatia
- Katmandu Symposium on Advanced Materials, Katmandu, Nepal, May 9-12, 2012
- Conference: 44th International Symposium on Macromolecules – IUPAC World Polymer Congress, June 24-29, 2012, Blacksburg - United States
- 76th Prague Meeting on Macromolecules: Polymers in Medicine, July 1-5, 2012 Prague, Czech Republik
- 9th International Conference on Polymer-Solvent Complexes and Intercalates (PolySolvat-9), September 11-14, 2012, Kiev, Ukraine
- 6th International Conference on Macro- and Supramolecular Architectures & Materials (MAM-2012), November 21-25, Coimbatore, India

IUPAC sponsored polymer conferences – 2013 (approved till now)

- 21st International Conference on Polymer Characterization – World Forum on Advanced Materials (PolyChar-21), March 19-30, 2012, Gwangju, Korea
- 5th International Symposium on Macromolecular Complexes (MMC-15), August 13-16, Clemson, SC, United States
- 10th International Conference on Advanced Polymers via Macromolecular Engineering (APME-2013), August 18-23, 2012, Durham, United Kingdom

IUPAC Sponsored Conferences – Polymer Division

Macromol Symp - IF (2005) = 0.913, disappeared from the impact ranking of scientific journals list since 2006, although MacroSymp is published as a book and is peer reviewed. MacroSymp is the first choice for publication of contributions from Polymer Division-sponsored Conferences because of the royalties that come with it.

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012

Number of conferences	10	11	9	9	7	11	8	13	8
No of publications in Macromol Symp	4	4	6	4	3	3	6	3	2
No of pages	1648	1170	1821	1233	459	566	1580	390	426

Conference locations:

2009

Europe: 5 (France, Germany, Czech Rep. Poland, Austria)

N. America: 2 (USA, Canada)

Asia: 1 (China)

S. America: 2 (Chile, Chile)

Australia: 1

2010

Europe: 6 (Germany, France, UK, Czech R., Poland, Greece)

America: 1 (Jamaica)

Asia: 1 (China)

2011

Europe: 5 (Russia, Spain, Czech R., Finland, Turkey)

N. America: 1 (USA)

Asia: 4 (Nepal, India, China, China)

Australia: 1

Africa: 2 (S. Africa)

2012

Europe: 3 (Croatia, Czech R. Ukraine)

N. America: 1 (USA)

Asia: 2 (Nepal, India)

Australia: 1

Middle East: 1 (Qatar)

Macromolecular Symposia (Wiley) Publications

Macro- and Supramolecular Architectures and Materials

January **2010**, Volume 287, Issue 1, Pages 1–176

Edited by: H.Ritter, E. Bezdushna, C. Koopmans, M. Munteanu, M.Tabatabai, K. E. Geckeler

POLYCHAR-17 World Forum on Advanced Materials

April **2010**, Volume 290, Issue 1, Pages 1–184

Issue edited by: J-M. Saiter, W. Brostow, M. Hess

New Frontiers in Macromolecular Science

September **2010**, Volume 295, Issue 1, Pages 1–137

Issue edited by: V. Cimrová, F. Rypáček

Modern Trends in Polymer Science – EPF'09 –

October **2010**, Volume 296, Issue 1, Pages v–xx, 1–646

Issue edited by: F. Stelzer, F.Wiesbrock

Polymers and Organic Chemistry

November **2010**, Volume 297, Issue 1, Pages v–xii, 1–239

Issue edited by: W. Skene

POLYCHAR-18 World Forum on Advanced Materials,

December **2010**, Volume 298, Issue 1, Pages v–xi, 1–199

Issue edited by: W. Mormann

2011 (3 issues) – 390 pages

Polymer-Solvent Complexes and Intercalates – Polysolvat 8

May **2011**, Volume 303, Issue 1, Pages 1–140

Issue edited by: J.–M. Guenet

Macromolecular Complexes
June **2011**, Volume 304, Issue 1, Pages 1–125
Issue edited by: J. Costamagna, F. M. Rabagliati, B. L. Rivas

Ionic Polymerization (IP 09)
October **2011**, Volume 308, Issue 1, Pages 1–125
Issue edited by: S. Penczek, A. Duda

POLYCHAR-19 World Forum on Advanced Materials March **2012**, Volume 315, Issue 1, Pages 1–232
Issue edited by: Rameshkhar Adhikari

Functional Polymeric Materials and Composites
May **2012**, Volume 313-314, Issue 1, Pages 1–194
Issue edited by: B. Klumperman, P. E. Mallon, H. Pasch, A. J. van Reenen

Dick Jones noted that in too many cases the same prominent speakers can be found again and again and the Conference organizers should take care of a refreshment avoiding permanent rotation of the same speakers. Dennis Smith asked about POLYCHAR and it was explained that it is a prestigious annual Conference on Polymer Materials Science already existing since 1992 and sponsored by IUPAC for many years.

12. Monitoring Projects (Michael Buback)

Michael Buback stressed the necessity to clean the Division files from old, long overdue projects and asked for termination or re-start as new project if appropriate. For new projects he proposed an inspection of each application by at least one member (not necessarily the chairperson) of each Division's Subcommittees to ensure the flow of information between the Subcommittees. He recalled IUPAC's mission and stressed the importance of creating interdivisional projects. Also, a project application is not necessarily fixed to two years – shorter and longer durations should be considered, too.

13. Strategy (Sawamoto)

Mitsuo Sawamoto thanked all those who have helped to update the list of World Polymer Organizations. There is no plan for new printed versions since the corresponding website of the Japanese Polymer Society is well accepted.

<http://www.spsj.or.jp/english/wpo/wpo.htm>

In case of inconsistencies or changes the Japanese Polymer Society should be contacted:

The Society of Polymer Science, Japan, Shintomicho Bldg., 3-10-9 Irifune, Chuo-ku, Tokyo 104-0042, Japan,
TEL: +81-3-5540-3776 FAX: +81-3-5540-3737 E-MAIL: intl@spj.or.jp

Jiasong He asked to strictly follow the IUPAC rules in addressing China and Taiwan, respectively.

Roger Hiorns addressed the problem of proper nomenclature and terminology in publications and the idea to introduce an IUPAC certificate. He suggested developing new strategies to spread that idea by involving National Societies in the activity and get the authors directly involved. There should be a joint strategy of Polymer Division and the entire group of IUPAC towards National Adhering Organizations.

Jung-Il Jin pointed out that there is a misbalance in the representation of countries in the Division structure. Future strategy should be more international and involve more countries with a high scientific standard and mentioned Thailand and South Africa as examples. There is a general problem in that retirement of members frequently goes parallel with a loss of contact to the corresponding National Organization.

14. 44th World Polymer Congress at VirginiaTech, Blacksburg (Tim Long, Richard Turner)

Tim Long reported about the state of the Conference and showed that everything is well prepared and ready to go next week. Sufficient funds could be collected and VirginiaTech is happy to welcome the polymer scientists from all over the world. There are about 1500 registered participants (~59% international attendees). 39 sponsors could be activated. The ACS-system is used for abstract submission. There is also an exhibition with 46 contributions.

15. The President's Statement (Michael Buback)

Michael Buback stressed the importance of recruiting new members for the Division to continue its development and to replace retired members. Possible successors of officers have to be identified well in advance, (Secretary, Vice-President) to ensure undisturbed continuation.

The budget situation of the Division is strained. About 2/3 of the budget is consumed by travel expenses and accommodation for meetings. The Samsung grant that has been raised by Jung-Il Jin is still a kind of a reserve (\$ 19,700), further income is provided by the Wiley royalties (\$ 4,000) which stresses the importance of publishing Conference papers in MacroSymp as the first choice. There is not much money left for projects, consequently, the project expenses have to be very critically checked. The goals for the near future have to be strengthening of the IUPAC label, improved evaluation and awareness of what other Divisions, Commissions and Subcommittees are doing. We have to keep in mind the importance of the awards into which the Division is involved in (Samsung, DSM) and the close connection with Polymer International.

All TMs and AMs are supposed to be assigned to certain duties within the Division. This should be reviewed critically by the Polymer division Members. The President asked the elected members to outline and suggest the reas and duties for which they feel responsible.

The NRs are asked to join the Divisions actions actively and in particular to contribute to in identifying potential new members from their countries.

Most of the activities of the Division are carried out by the core Subcommittees: Terminology (& Nomenclature) SPT which was the first one, Structural Properties, Education SPED, Congresses and Trends, Kinetics. All of them should be represented by a TM and an AM. Further important fields are Strategy, Communication and geographical spread that need close attention. The election of TMs is organized by the IUPAC Secretariat and second candidates may be appointed as AMs.

During the Bureau Meeting April 13th-15th 2012, the activities of the Polymer Division were very much appreciated. In particular the engagement in the very successful International Year of Chemistry, the 'IUPAC Transnational/Transcontinental Call for Proposals in Polymer Chemistry', the commitment of the Division in the World Polymer Congresses were acknowledged, the new Wikipedia Project found attention, and the Scientific Prizes that are under the auspices of the Polymer Division.

Jung-Il Jin pointed out the need to continue with the cooperation concerning the DSM Award about which there is only a temporary agreement with DSM.

Igor Lacik observed that there is still the problem of appropriate and effective representation of IUPAC that is frequently rated as 'too academic'.

16. Report on Division Web Page and Electronic Publications (dos Santos)

Claudio dos Santos gave a short statement about the internet presence of the division within the IUPAC website and addresses still lingering problems. There is still the old website with information late into the 1990ies www.old.iupac.org an intermediate website www.stage.iupac.org and the new website www.iupac.org . The new website (Feb. 2012) still suffers from some drawbacks and the updating still faces problems. These are the removal of (old) bugs, improvement of efficiency, to provide easy further growth and all this happens at the same time, which is a big task. A goal among others is a real-time updating on a daily automatic basis, and a faster and easier management. There were also significant problems with the first provider/developer of the programs. Claudio dos Santos encouraged all Subcommittee Chairs to check their web presentation and report to him.

17. International Funding Call (Nicole Moreau⁵, Markus Behnke⁶)

Nicole Moreau joined the meeting as former IUPAC President who was deeply involved in this activity and Markus Behnke (DFG-Germany) as representative of the National Funding Agencies. The program was a great success fostering a systematic cooperation and was paid by national funding agencies. At the end of the year 2012 a new multilateral program with the title Sustainable Chemistry is expected.

In the first round seven teams out of twenty eight proposals were supported. Comparable numbers are expected for the second round, that aims on replacement of rare or toxic chemicals and recycle chemicals that cannot be

⁵ Past President IUPAC

⁶ Deutsche Forschungsgemeinschaft (DFG)

replaced. The call is supposed to go out in fall/winter 2012/13 and the final panel meeting is scheduled one year later. The final report by Werner Mormann about the first round is expected by the end of 2012.

Markus Behnke mentioned that after the first round, which was polymer based, projects can now continue in the normal frame. In general there is agreement among the organizers about the procedure and only a few topics are open. Jung-Il Jin expresses his thanks to Markus Behnke as 'the centre of the project' and he expressed his disappointment about the fact that there was no Asian funding agency involved in the first round and he hopes that they will grasp the second chance since there were positive signs from a number of countries and the contacts should be fostered. All countries are invited and the goal is a complete network of National Funding Agencies being involved. Developing countries without Funding Agencies are encouraged to ask for help from other Funding Agencies or IUPAC.

18. Future World Polymer Congresses (Supawan Tanatayaon, Voraveen Hoven – Thailand, Cem Turcel, Erkan Baykut – Turkey, Manuel Aguilar, Enrique Saldívar – Mexico, David Lewis – Australia)

Application to arrange a World Polymer Congress is advised to be done well in advance (say 10 years). The venue needs to be carefully selected and the Scientific Program as well as the Advisory board to be closely monitored by the Polymer Division. At the present time MACRO 2014 (Thailand) is approved, although it seems that there is not yet an official **written** approval existing. MACRO 2016 (Turkey) has preliminary approval (since the Puerto Rico GA), there is now a first application from Mexico and Australia for MACRO 2018 and MACRO 2020, respectively. Mexico is presently not a member of IUPAC.

Supawan Tanatayanon gave up-to-date information about **MACRO 2014**, July 6-11, Chiang Mai, Thailand, hosted and supported by The Chemical Society of Thailand, The Polymer Society of Thailand, The Chiang Mai University, and the Thailand Convention and Exhibition Bureau. Chiang Mai is the most important city in Northern Thailand (capital of the Province having the same name), about 700 km (~1hr. flight) from Bangkok - http://de.wikipedia.org/wiki/Chiang_Mai. The venue of the conference – the Chiang Mai International Conference and Exhibition Centre – is about 20 min (car) outside the city centre and 30 min from the International Airport. The conference organization lies in professional hands (Wild Blue Congress Organizer) with about 10 years of experience and more than 60 Congresses. The Advisory board stands but requires further modification. About 1,200 participants are expected and 100 invited speakers, 4 plenary and 4 keynote speakers are suggested at the moment. Special workshops/short courses (Natural Rubber, Polymer Education, Polymer Characterization) are also planned.

Accommodation will be available from \$ 120 ++ in the highest categories over \$80-\$50 to ~\$30 in the lowest category of hotels and \$10-20 in guest houses.

A budget of about \$200,000 from sponsors is presently expected. The budget calculation should be sent to Michael Buback.

The following Scientific Sessions are planned:

- Recent Developments in Controlled Polymerization (M. Sawamoto)
- Recent Advances in Functional Polymers (T. Demming, P. Theato)
- Polymer Physics: Theoretical Studies and Modeling (M. Rubenstein)
- Advances in Polymer Characterization (N.N.)
- Polymer Processing and Composites (W.Chinsirikul)
- Macromolecular Assembly and Nanostructured Polymer (R. Advincula)
- Polymers for Biotechnology and Biomedical Applications (M.Akashi)
- Environmentally Benign Polymers (A.-C. Albertsson)
- Innovation in Polymer Industry (S. Tantayanon)
- Polymers for Emerging Technology: Energy, Information Technology, Optics, Electronics, and Opto-electronics (E. Reichmanis)
- Polymer Education (W. Mormann)
- Polymeric-based Carriers for Medical and Cosmetic Applications (T.Emrick)
- Biopolymers: Advances in Materials, Biomedicine and Health (R. Gilbert)
- Natural Rubber: From Basic to Applications (K. Suchiva)
- Nanofabrication and Nanopatterning: Challenges and Innovation (C. Ober)

IUPAC related activities

- **Meeting:** SPT Meeting (4 days: 09.07.-12.07.) + Division Meeting (2 days: 13./14.07.)

(meeting facilities + coffee break + hotel special rate + excursion + dinner)

- **Awarding:**
The Samsung-IUPAC Young Polymer Scientist Award
The DSM Performance Materials Award + Symposium
The Polymer International-IUPAC Award
IUPAC Poster Awards (supported by IUPAC)
- **Publication:** Conference proceeding published in
Wiley-VCH Macromolecular Symposia
- **Scholarship:**
Travel support or registration fee waive
for international young scientists
- **Promotion for MACRO 2016:** Program book/handout, Desk, Presentation

Special care will be taken for:

An International mix of speakers, representation of academia and industry, gender diversity, and not to copy the previous list.

The estimated fees are:

Early Bird

- Delegate (M)	Delegate (NM)	Student(M)	Student (NM)
USD 450	USD 500	USD 200	USD 250

Regular

- Delegate (M)	Delegate (NM)	Student(M)	Student (NM)
USD 500	USD 550	USD 250	USD 300

Onsite

- Delegate (M)	Delegate (NM)	Student(M)	Student (NM)
USD 550	USD 600	USD 300	USD 350

*accompanying person USD 100 flat rate *M – Member, NM – Non-Member*

The mailing list of MACRO 2012 will be forwarded by Tim Long (VirginiaTech).

Jung-II Jin strongly supports the organizers and stressed their experience in organizing Conference. The direct contact person is Voravee Hoven vipavee.p@chula.ac.th

MACRO 2016, Istanbul, Turkey already has a provisional approval (2011, GA Puerto Rico). The organizers are well experienced in organizing Conferences. They will prepare a Scientific Program similar to MACRO 2012 Program. The estimated budget is \$ 700,000. There will be a special Young Polymer Scientist's Session for PhD candidates and young graduates.

Mexico applies for **MACRO 2018** (100 years anniversary of IUPAC) in Cancun, a place on the Carribean Sea or the Baya California. Mexico is not yet member of IUPAC but strives eagerly to become a member well in time. Greg Russell observed that we should know about the progress of this item on the GA 2013, and Jung-II Jin recommended immediate action, since official steps usually take their time, and hence recommended to directly contact Nicole Moreau for assistance and support.

Australia announced interest in hosting **MACRO 2020**. Jung-II Jin mentioned that there should not be a clash with other local meetings and the venue of the GA 2019 should be known. In general the Australian application is very welcome. They are flexible concerning the date and could probably step in for 2018 if necessary.

19. Vice-President's Topics (Russell)

Greg Russell welcomed the Division and introduced himself and his perspective for his service as Vice-President of the Division. He quoted Michael Buback's demands from the Puerto Rico Meeting in 2011:

1. Involve young scientists and industrial scientists
 2. Polymer activities in developing countries; division role in education
 3. Strengthen IUPAC label and make organizations ask for IUPAC advice/opinion
 4. Stimulate projects; identify experts and try to convince them to work for IUPAC
 5. Provide expert fora for identifying/solving problems (dilemma papers + initiatives)
 6. Broaden IUPAC offer: nomenclature + agreed data + recommended techniques
 7. Strengthen ties to national organizations
 8. Monitoring of projects
 9. Stronger participation of NRs in the activities of the Polymer Division Committee
 10. One action (idea, suggestion, initiative) by each PDC member per year
- and added his view on the demands and challenges lying ahead:

- MACRO meetings (2018, 2020)
- Publication-driven projects via subcommittees
- SPT and Education
- Future leaders (especially next VP!)
- Collegiality and friendship via personal contact

Greg Russell wants to put emphasis on web-based information systems and on there being an established progression for young scientists from observer to full membership of the Division, as was already established in the old Commission structure. Mitsuo Sawamoto raised the question of how to recruit and select new members. Inviting, observing and their cooperation and interest appears to be a good approach, as well as personal contacts.

20. Other Businesses (Buback & participants)

Joo-Soep Kim (NR Korea) mentioned that for the NRs it is useful to know what is going on so that they can report to their national organizations. Although not all NRs are always present on the meetings it can be taken for granted that the Minutes are always forwarded to the NRs, Michael Hess noted, however, that there is often little feedback.

Mario Malinconico (NR Italy) mentioned that the Italian Research Council will have a Polymer Scientist as President who will continue the traditionally good relations with IUPAC. Also, there will be a CHEMRAWN event in the near future in Italy where the Polymer Division should be involved.

20. Date of Next Meeting (Hess)

47th IUPAC General Assembly, 09.-15.08.2013, Harbiye Military Museum & Conference Centre and Lütfi Kırdar Congress and Exhibition Centre, Istanbul, Turkey

21. Closing remarks

Michael Buback closed the 2012 meeting of the Polymer Division and thanked all participants for their fruitful cooperation during the last year wishing some interesting days during the following World Polymer Congress in the nearby Blacksburg. He used this opportunity to thank the organizers of MACRO 2012 for their support in organizing the Division and SPT-meeting in Roanoke.

Michael Hess (Secretary), June 2013

APPENDIX 1
IUPAC POLYMER DIVISION MEETING
SUBSEQUENT TO THE SPT-MEETING

(before 44th World Polymer Congress, Blacksburg, VA, USA)

Hotel Roanoke & Conference Centre
110, Shenandoah Avenue

Roanoke, Virginia, USA

09.30–12.30 & 14.00–17.30, June 22, 2012; 09.00–12.30, June 23, 2012

Agenda

President's Introductory Remarks and Finalizing of the Agenda (Buback)

Apologies for Absences

Approval of the Minutes of the Division Committee Meeting, Puerto Rico, July 2011 (Hess)

Matters arising (Buback)

Report on InterDivSubcomMaterialsChem (ISMC) (Ober)

Report on Terminology and Nomenclature Projects (Jones)

Report on Structure–Property Projects (He)

Trends in Polymer Science (Yagci)

Photosession during break

Report on Polymerization Projects (Russell)

Report on Education Projects and Activities (Mormann)

Reports on Division–sponsored Conferences (Kubisa proxy Buback)

Monitoring of Projects (Buback)

Strategy, Communication (Sawamoto)

2nd DAY

Reports on Division–sponsored Conferences (Kubisa proxy)

President's Statements (Buback)

Report on Division Web Page and Electronic Publications (Dos Santos)

Visit of IUPAC Past President Nicole Moreau and Dr. M. Behnke (DFG): International Funding Call

Future IUPAC World Polymer Congresses

Vice–President's Topics (Russell)

Any Other Business (Buback and participants, Statements by NRs)

Date of Next Meeting (Hess)

47th IUPAC General Assembly, 09.-15.08.2013, Harbiye Military Museum & Conference Centre and Lütfi Kidar Congress and Exhibition Centre, Istanbul, Turkey

Appendix 3

Project Expenses vs Budget

Through 4 June 2012	Actual	Budget	Budget Over/ (Under)	% of Budget	Planned End Date
400-Macro					
IMACRO Contract	50,146	60,000	(9,854)	84%	
Samsung Fund Income	34,500	54,215	(19,715)	64%	
Wiley VCH Royalties	8,512	12,980	(4,468)	66%	
2000-028-1-400 Russell	3,000	3,000	-	100%	31-Dec-2012
2003-009-1-400 Wassner	-	-	-	-	30-Jan-2008
2003-038-4-400 Alstaedt	7,999	8,000	(1)	100%	30-Jun-2012
2003-060-2-400 Chang	6,500	6,500	-	100%	31-Dec-2012
2004-022-3-400 Fitzgerald	420	7,000	(6,580)	6%	30-Apr-2007
2004-040-1-400 Vana	3,498	3,500	(2)	100%	1-Sep-2012
2004-043-1-400 Vert	9,176	10,000	(824)	92%	30-Jun-2012
2005-005-2-400 Chang/Stepito	6,000	6,000	-	100%	31-Dec-2012
2005-007-1-400 Wilks	-	-	-	-	31-Dec-2005
2005-011-3-400 Luruli	2,344	5,000	(2,656)	47%	31-Dec-2012
2005-023-2-400 Steininger	1,700	3,000	(1,300)	57%	31-Dec-2013
2005-043-2-400 Ober	6,000	6,000	-	100%	30-Jun-2012
2006-004-1-400 He	6,000	6,000	-	100%	30-Jun-2012
2006-028-1-400 Vohidal	6,000	6,000	-	100%	1-Sep-2009
2006-041-1-400 Hess	6,000	6,000	-	100%	31-Dec-2012
2007-004-1-400 Handge	2,425	4,000	(1,575)	61%	31-Dec-2013
2007-008-1-400 dos Santos	11,000	11,000	-	100%	1-Sep-2012
2007-058-1-400 Gilbert	2,664	6,000	(3,336)	44%	31-Mar-2012
2008-015-1-400 Mormann	5,578	6,000	(422)	93%	30-Jun-2011
2008-020-1-400 Hodge	3,468	5,000	(1,532)	69%	31-Dec-2011
2008-028-1-400 Auhl	-	5,000	(5,000)	-	31-Dec-2013
2008-032-1-400 Hiorns	5,000	5,000	-	100%	31-Dec-2011
2009-019-2-400 Meira	3,029	5,000	(1,971)	61%	31-Dec-2012
2009-047-1-400 Hellwich	4,354	6,000	(1,646)	73%	1-Apr-2013
2009-050-1-400 Moad	2,870	5,300	(2,430)	54%	31-Dec-2012
2010-007-1-400 Moad	2,320	6,000	(3,680)	39%	1-Apr-2013
2010-019-1-400 Bucknall	3,313	5,000	(1,687)	66%	1-Apr-2014
2010-027-2-400 Bertin	-	1,000	(1,000)	-	31-Dec-2013
2010-029-3-400 Yamaguchi	2,898	3,000	(102)	97%	31-Dec-2013
2010-032-3-400 Mormann	-	9,000	(9,000)	-	31-Dec-2013
2010-036-1-400 Kubisa	1,442	2,000	(558)	72%	31-Dec-2012
2011-013-2-400 Hess	600	5,360	(4,760)	11%	31-Dec-2012
2011-033-1-400 Chang/Stepito	940	3,000	(2,060)	31%	
2011-034-2-400 Barner	-	1,000	(1,000)	-	1-Mar-2014
2011-052-1-400 Kratochvil	5,000	5,000	-	100%	31-Dec-2012
2012-001-1-400 Ober	-	6,000	(6,000)	-	31-Jan-2015

Wrong, has to read
Dec. 2013