

Minutes of the Meeting of the Interdivisional Subcommittee on Materials
Chemistry (ISMC)

Thursday, July 28 2011, Sol Boardroom, Sheraton Hotel, San Juan, Puerto Rico

Participants: Len V. Interrante (chairman), Jim A. McQuillan, Angela Wilson, Jan Reedijk, Alan Hutton, Chris Ober, Sanjay Mathur, Lars Ohrström, Dick Jones, Michel. J. Rossi, Jung-II Jin (joined at 1:40 pm), Ken Sakai, Miki Hasegawa (YO is a Young Observer at the 2011 IUPAC General Assembly), Ilya Zharov (YO), Michael Hurrey (YO), Justin Youngblood (YO).

The meeting was called to order at 1:10 pm by the chairman L. Interrante. M.J. Rossi volunteered to write the minutes of this meeting. The meeting agenda (appended) was unanimously approved by all present.

The chairman gave a brief overview of the history of the ISMC based on a document drafted by Tony West (appended). The essence of it is that the present structure of the Subcommittee is not adequate to foster interdisciplinary collaboration among all IUPAC Divisions. Materials Chemistry is a large and thriving field of chemistry whose representation within Div II (Inorganic Chemistry) is deemed inadequate at present. The IUPAC Website currently lists Div I (Physical and Biophysical), II (Inorganic) and IV (Polymers) as underwriting Divisions; however, the contribution of the High Temperature Materials Chemistry Project (HTMC) and the Workshop on Advanced Materials (WAM's in 1999, 2002 and 2005) in terms of the intellectual input into Materials Chemistry were rightly emphasized. S. Mathur pleads for Div II leadership of the ISMC; however, the chairman disagreed by suggesting a rotating leadership of ISMC beginning with Div IV (C. K. Ober). Div I promised to designate an ex officio delegation to ISMC once the interests of the incoming TM's will have been established. The Division II delegates are S. Mathur and M. Leskella.

L. Interrante proposed that the Subcommittee, at least for the next biennium, should retain its current structure of having a core membership consisting of up to 2 representatives from each of the participating Divisions (and, hopefully in the future, also Standing Committees), whose attendance at off-year meetings would be supported by the respective Divisions or through Project funding. These "core" members would constitute the voting or "Titular" members of the Subcommittee, but any and all IUPAC members who wish to participate in its meetings would be welcome to join in the discussions and share their opinions. This was suggested to insure that the Subcommittee retain its current interdisciplinary and inter-Divisional character and not become the sole province of one or two Divisions.

It was deplored that ISMC does not have representation from COCI (Committee on Chemical Industry), Div III (Organic Chemistry) and VIII (Nomenclature), all of whom have an important role to play. Interrante agreed to formally invite these and any other interested Divisions and Standing Committees to join the Subcommittee prior to the end of his term as Chair in December. Ober will again invite them once the location of the next ISMC meeting is determined.

M. J. Rossi pleaded for a pragmatic approach in soliciting proposals through direct personal contacts to which S. Mathur agreed. A. Wilson suggested the creation of a list of "hot" topics in Materials Chemistry (MC) in order to solicit specific MC projects. The chairman admonished that TM's of all concerned IUPAC Divisions should approach colleagues in active pursuit of project leads in MC. It was also pointed out that the Cornell Meeting of October 2009 promised an extended and detailed list of subject areas that to date has not materialized. However, the minutes of that meeting contains a non-exhaustive list of possible subject areas. The chairman pointed out that meetings during General Assemblies were usually not scientifically productive owing to the limited availability of time and because organisational and fiscal questions were dealt with in priority.

The chairman subsequently displayed a presentation of recent projects in Materials Chemistry since 2006 that have been supported by Divisions I, II and IV. C. K. Ober pointed out the popularity of the polymer education website (<http://www.iupac.org/polyedu/index.html>) with its most widely visited page: "What is a polymer?" A proposal to establish an analogous website devoted to education in materials chemistry is currently being developed. Several participants voiced support for a similar effort in electronic communications (i.e. an appropriate website) to bring materials chemistry concerns to the fore in the framework of the ISMC. A discussion ensued as to the envisaged fields of activity for the coming years. Some of the items mentioned are (non-exhaustive list):

- Nomenclature, deemed to be of increasing importance, especially for electronic retrieval and search of materials such as polymers and composite materials
- Photoactive materials (see also current project by A. Griesbeck (<http://www.iupac.org/web/ins/2008-037-2-300>))
- Metal-organic frameworks (MOF's). Here nomenclature and terminology issues are emerging as well
- Teaching materials chemistry
- Measurement Standards and References in H₂O-splitting/solar hydrogen technology
- Metrology aspects and standardisation in advanced materials

A lively discussion followed that raised the fundamental question as to why IUPAC "needed" an ISMC at all. The consensus emerged that the plurality of opinions usually has a synergistic effect, which is the reason that the ISMC shall put their support structure on a wider basis within IUPAC owing to the interdisciplinary nature of materials chemistry.

As far as the organisation of the ISMC for the next two years is concerned it was unanimously decided that C. K. Ober will be chairman and that an off-year meeting be called next year. In order to minimize its cost this meeting should coincide (spatially and temporally) with the off-year meeting of one of the participating Divisions, Div IV being suggested as a possibility. At the end Jung-Il Jin, past IUPAC president, raised the question of the connection of the ISMC to industry. Efforts in this direction should be undertaken as M. Dröscher is the new chair of COCI. Jung-Il Jin also reminisced about similar discussion within Div IV fifteen years ago about the relative weights between basic polymer science and technological applications. However, M. J. Rossi pointed out that we are facing a new challenge today in view of the hyperactive Asian MC scene which was absent fifteen years ago.

The following action items emerged:

- Hold an off-year meeting in 2012 to focus on the scope and perspectives of the ISMC in the near future. This should also be seen as an opportunity to design future scientific activities. The new Chair of the Subcommittee, Chris Ober, will undertake with the 2012-13 Subcommittee core members, to determine the site and timing for this meeting.
- L. Interrante will work with C. K. Ober to insure the completion and submission of a Proposal in the near term on behalf of the Subcommittee to develop a website dedicated to education in materials chemistry. This would be analogous to the website that Ober has developed in the area of education in polymer science. It would target university students and faculty that are seeking educational materials for courses, as well as other scientists and engineers and members of the public who are seeking general knowledge in the area.
- The current chair will extend a formal invitation to the 2012-13 officers of COCI and Divisions III, V and VIII to join the Subcommittee and to designate up to 2 of their TM's as "core" members of the Subcommittee for the next biennium.
- Solicit MC-oriented proposals with renewed vigor, either through personal contacts of the ISMC members or by approaching individuals who have published relevant work in the various subareas of materials chemistry
- Actively think about and propose to create a web page focused on the presentation of the ISMC to a wider public educated in chemistry, at least at a basic level. The goal is to stir up interest and stimulate the submission of spontaneous proposals

The meeting adjourned at 3:15 pm after having thanked the current chairman for his considerable efforts in the recent past.

Drafted by Michel J. Rossi, Div I, August 11 2011.

Appendix 1

The IUPAC Interdivisional Subcommittee on Materials Chemistry

Agenda – IUPAC GA Meeting, San Juan, July 28, 2011-08-11

1. Introductions and designation of a secretary to take the meeting minutes
2. A brief history of the Subcommittee, its purpose and scope (L. Interrante)
3. Presentations from the current Subcommittee members on materials chemistry-related Projects planned or in progress
4. Discussion of potential future projects that could be undertaken by the Subcommittee
5. Discussion of the future composition and direction of the Subcommittee

Appendix 2

The IUPAC Interdivisional Subcommittee on Materials Chemistry

by Anthony (Tony) West

A brief history: After the demise of “Commission 2.4” on High Temperature Materials in the wake of the reorganization of IUPAC in 2000, several Commission 2.4 Projects were continued under the auspices of the Materials Chemistry Subcommittee of Div. II, with the participation and support of Division I (Physical Chemistry). Later Projects on polymeric materials, originating in Division IV, were cosponsored by Division II and became part of the scope of this Subcommittee. For much of this time, Division II member John Corish served as Chairman, until his election as Treasurer of IUPAC, whereupon Tony West assumed this role.

Throughout this period, Subcommittee meetings were attended primarily by Division II members, and Divisions I and IV members became occasional participants when meetings were held as part of the biennial GA's. During off-years, the Subcommittee continued to meet without participation of other Divisions. Thus, the predominance of Division II members at all of the meetings ensured that this Subcommittee would remain largely ‘inorganic’ in scope and Project focus. Throughout much of this time, it was recognized that the true scope and importance of the growing field of ‘materials chemistry’ was not being adequately addressed by this Subcommittee and, in 2005, a Project entitled “Towards Defining Materials Chemistry” was begun, with Prof. Peter Day as the Project Leader.

The goals of this Project were: “to ‘assemble, collate and disseminate information about the scope of the newly-emerging discipline of materials chemistry, leading to an authoritative definition of the subject within the family of chemical sciences’ and further, as a corollary, ‘to recommend to IUPAC how this new discipline might best be represented within the IUPAC structure’.” This Project is now completed with two publications [Chemistry International, May- June 2009, pp. 4-8; Pure Appl. Chem., 81(9), 1707-1717(2009)] and a proposed definition of materials chemistry resulting:

"Materials chemistry comprises the application of chemistry to the design, synthesis, characterisation, processing, understanding and utilisation of materials, particularly those with useful, or potentially useful, physical properties."

Moreover, it was concluded that:

"Materials chemistry impacts on, and requires input from, many of the traditional Divisions of chemical science (physical, organic, inorganic, polymer etc) as defined by IUPAC. It can also be argued that its ubiquity and importance both for science and industry merit a more prominent status in the IUPAC structure. At present the interests of the subject are overseen by the Subcommittee on Materials Chemistry, which is formally placed under the Inorganic Chemistry Division. We argue that this arrangement no longer responds adequately to the size and reach of the materials chemistry community, which encompasses a broad range of materials and disciplines. Indeed, although the Subcommittee on Materials Chemistry was intended from the outset to function as an interdisciplinary committee, with members from Divisions other than Division II, it has proven difficult under the current structure to attract to its meetings (especially off-year meetings) a sufficiently broad representation from other Divisions. The Project WG suggests that IUPAC address the present deficiency by establishing a cross-divisional Committee that would work with all the current IUPAC Divisions to develop and co-sponsor new projects, in the area of chemical education, nomenclature, terminology, health and safety, etc., that will increase the recognition of the current and future importance of this field within the international chemistry community."

In response to this call for a change in the status of materials chemistry within IUPAC, the members present at our meeting in Glasgow decided to reconstitute the Subcommittee on Materials Chemistry in a manner that would make it truly "Interdivisional" in scope and function. Len Interrante agreed to take on this task as interim chairman of the Subcommittee. Based on initial discussions with members of Divisions I and IV, two members of each Division were designated to serve as initial members of the reconstituted Subcommittee and a meeting was scheduled for October 17, 2009 at Cornell Univ. in Ithaca, NY to discuss the future of the Subcommittee, and of materials chemistry, within IUPAC and to come up with ideas for some proposed Projects that would recognize the truly interdisciplinary nature of this field.