

**Minutes of the meeting of IUPAC Commission 11.3.  
Berlin, August 9<sup>th</sup> and 10<sup>th</sup>, 1999**

Attendance: Balducci, Boehm, Carlsson, Chadwick, Chatillon, Kizilyalli, Voronin, Kolar (Secretary), Rosenblatt (Division Vice-President).

Afternoon session joined by Corish (Division President).

Observers: Mintmire, Froben.

Apologies for absence: Lewis, Verweij, Spear.

1. Introduction & announcements

Earlier this year, Karl Spear announced his resignation as commission chair due to new obligations. He was elected Vice-President of the Electrochemical Society, an active position that leads to becoming President of the Society.

Commission members learnt of his decision with deep regret, expressed their acceptance and thanked Spear for the work done for the commission and IUPAC.

Gerd Rosenblatt, former Commission 11.3. Secretary and Chairman, accepted a plea to chair the meeting. His readiness to help was highly appreciated by commission members. Chatillon was elected as the new President of the commission. Chatillon proposed that he starts executing his responsibilities as chairman after the meeting.

Kolar will continue as Secretary in the next two year period.

IUPAC is in process of reorganisation. The commissions will be dissolved after the next IUPAC conference in Brisbane in 2001. Until then the commissions are invited to continue their activities. The list of officers (Chairman & Secretary), titular members, associate members and national representatives for the period 1999 - 2001 was finalised during the meeting. Details are included in the minutes under item No. 22.

John W. Mintmire of the Naval Research Laboratory and Froeben from U. of Berlin were invited to attend the meeting as observers.

2. Finalisation of the agenda:

After receiving the agenda, commission members were informed about the IUPAC strategic initiative on materials. Rudi Metselaar strongly urged that the commission proposes relevant projects. This item was to be discussed under item No. 21, "new projects". A new item was added, No. 26, a report from CTC delivered by Kizilyalli.

3. The minutes of the Ljubljana meeting were accepted.

4.-6. Reorganisation of IUPAC, the future of commission 11.3, the new division committee and proposed functions were reported by Rosenblatt and in the afternoon independently by Corish.

Both expressed concerns regarding the new organisation. The same concerns were expressed by the commission members at the meeting in Ljubljana. A number of members of various IUPAC bodies also expressed their concerns regarding the continuity in scientific activities. Nevertheless restructuring of IUPAC is under way and has to be realized.

Important aspects of the reorganisation are:

- involvement of more experts to carry out specific short term projects,
- change of funding basis (financing not of individuals ("Titular members") but of projects,
- to focus the scientific work in divisions,
- The existence of the present commissions will terminate at the end of 2001.

In new IUPAC scheme, the main responsibility for activity will be on division members; Therefore the division must be strengthened. 5 new members were to be elected at the open divisional meeting on Tuesday, 10<sup>th</sup> August afternoon. They will join Corish (President), Rosenblatt (Vice-President) and Daryle Bush (Secretary). 2 more members will be elected later. Commission 11.3 members received CVs of 9 candidates (Silvio Aime, Baltazar de Castro, Tyler B. Caplen, William J. Evans, Leonard Hewante, Leonard Lindsay, Bernard Meunier, Richard R. Schrock and Anthony R. West).

The possibility of the creation of new commissions is still under consideration. The earliest that a proposal to create a new commission can be brought before the IUPAC Council will be at the Brisbane general assembly in 2001. This requires presentation of a proposal to the Bureau in 2000 and the formation of a three member committee. The procedure transfers the burden of proof to those who wish to create a new commission. The Bureau has already received the formal request that commission IV.1 (Nomenclature) be continued. The Bureau authorized the President to form an *ad hoc* Committee on IUPAC strategy for Chemical Nomenclature.

#### 7. 230/23/89 Terminology for diffusion in the solid state

The project was successfully completed by Kizilyalli, Corish & Meteslaar. 25 referees responded and their input significantly increased the value of the manuscript. The manuscript entitled "Definition of Terms for Diffusion in the Solid State" was accepted for publication in PAC, and is expected to be published in the July/August issue.

Rosenblatt and the commission members expressed high appreciation for the work performed.

#### 8. 230/24/93 Chemical research needed to improve high temperature processing of advanced ceramic materials (Kolar reported)

The latest version of the report was distributed to commission members 3 weeks before the meeting. The manuscript was significantly improved since the Ljubljana meeting. The help of Karl Spear in editing the manuscript was significant. Commission members accepted the document. Minor revisions are still possible; the deadline for suggestions is the end of September. After receiving the finalized manuscript from Kolar, Chairman Chatillon will start the procedure for publication in PAC. The procedure is described in the "blue book", the number of referees has to be determined. Since it is a technical report and 14 experts contributed to it, an extensive number of reviewers may not be necessary. Rudi Metseelaar should be consulted.

#### 9. 230/27/95 Terminology of vapour deposition

Spear was not present to report, neither did he send the written report. Carlsson offered to continue the initiative. Karl expected cooperation from Hastil (laser ablation terminology), Teer (PVD process), Chatillon (names of experts for MBE terminology) and Leskola (Atomic layer epitaxy). Mintmire will provide references of Jim Butler & John Russel.

A progress report is expected before the Jülich informal meeting.

#### 10. SC2(232/1/91) Characterization of carbonaceous materials & new carbons

Peter Boehm reported delay, since Professor Heintz (U. of Buffalo, NY) was not able to send the finalised manuscript as expected. Boehm will continue reminding Heintz. The manuscript when received will be sent for comments to Mintmire & Carlsson and also to the commission Chairman & Secretary.

In the case that the project would be prolonged over the year 2000, the IUPAC secretariat should be notified and the existence of subcommittee 2 should be prolonged.

#### 11. PST-18 Calculation of equilibrium thermodynamic properties of high temperature superconductors (Voronin reporting)

The project and working group were proposed in 1991. The final goal is to recommend for use in design, research and technology a set of self-consistent thermodynamic functions for three superconductors usually denoted as the Y123, Y124 and Y247 phases.

The first part of the final results, namely "I. The Y123 solid solution", was presented for discussion. In accordance with the recommendation of the Commission meeting in Ljubljana, the results were presented as a manuscript prepared for publication in PAC. It contains full data on the thermodynamics of the solid Y123 phase, including its behaviour at high pressure. The manuscript is entitled "Thermodynamic characterization of high-temperature superconductors in the yttrium-barium-copper-oxygen system. I. The Y123 solid solution.

After discussion, commission members approved the manuscript. The status of PST should be changed to project. Voronin should fill in the project proposal forms. He should send the manuscript to commission Chairman Chatillon for further procedure. Since this is technical report, an extensive number of reviewers may not be necessary. Consult Rudi Metselaar.

#### 12. PST 16 Teaching of high T materials chemistry at university:

Balducci is responsible and submitted a written report describing the relevance of the project and delineating the problems. Commission members considered that it would be pity to discard the work already done. Therefore the PST is advanced to a project (X/Y/1999).

The purpose of the project is to help university - level instructors to include more material on high temperature chemistry in the basic chemistry/solid state chemistry curriculum by suggesting topics and listing references.

The project is related to materials chemistry. Whereas high temperature material properties are adequately covered in general and specialized materials courses, the mechanisms of chemical reactions, phase equilibria and thermodynamics are not adequately covered.

Balducci is expected to compile a brief report by December (A list of topics, which may be included in the curriculum, with brief explanations and references). In the next step, a general introduction to each topic may be elaborated (Carlsson recommends) - Balducci should fill in the project initiation forms to register the project.

#### 13. WB-3 Structure & properties of ceramic fibres

Lewis sent a written report. There is now a recent publication, which covers this topic (Fine Ceramic Fibres - Ed. by A. R. Bunsell and M. H. Berger, Marcel Dekker, Inc., New York, March 1999, ISBN:0-8247-1951-4). Hence there is no justification to convert this into a TF and the WB should be terminated.

#### 14. 230/9/83 High T mass spectrometry

The project is practically finished (a few additional references needed) and ready to be sent to the referees. Gerd will provide an accompanying letter for the referees, which can be modified. Chatillon should remind him by e-mail. The result is extensive report (~ 50 pages) with 150 references. Chatillon deserves congratulations for successful completion of the long-standing project (1983).

#### 15. 230/29/93 Surface analysis of ceramics

Lewis sent apologies for the meeting, but submitted a written report. There is no possibility of the nearterm completion of the project. The co-authors (Dowsett and Watts) have made no further progress due to exceptional pressure of work concerning teaching quality assessment etc. Lewis suggested that the project be shelved for the time being.

Commission members regard the project as important and are hesitant to abandon it. The project should stay open till the next meeting. In the meantime, Kolar and other commission members will try to find a corresponding expert (maybe Zalar), who could be engaged under new IUPAC scheme as a "provisional member". Suggested names should be communicated to Kolar (Mintmire, Hilpert).

16. 230/29/95 Teaching experiments in solid state chemistry (Kizilyalli reported).

At the Ljubljana meeting, Kizilyalli presented a list of 25 experiments, developed and edited by various authors. The plan was to make the experiments available to interested persons on the IUPAC website. Kizilyalli was asked to reorganize the format of each experiment to include at the beginning of the write-up: (1) equipment needed, (2) chemicals needed, (3) time required and (4) safety aspects.

Kizilyalli sent the report to Spear for editing, but he did not answer yet. Chatillon (Chairman) and Kolar (Secretary) will contact Spear.

In parallel action, Kizilyalli will contact Mikula, U. of Vienna, who may contribute to the project.

The finalized report will be put on the WEB with a link to CTC. Corish informed Jost, who is ready to arrange this, but it has to be in correct format. Contact Fabienne Meyers in IUPAC Secretariat.

When on web, the report should be announced in Chemistry International and possibly in J. Chem. Education.

17. TF-20 terminology used in sol-gel processing of advanced ceramics.

Holland did not send the report, although Corish did remind her. Allan Chadwick volunteered to take the responsibility for the inorganic division position project.

18. PST-19 Thermochemical & thermophysical properties of refractory materials

Balducci proposes the topic to stay as it is. A description of the general idea & project would be a good start for further elaboration. Balducci should prepare a short document as soon as possible.

19. 230/28/95 Terminology of silicon nitride based ceramics:(Metselaar reported)

Metselaar published the report in two international ceramic journals as provisional recommendation and invited comments but none were received. The final manuscript was sent to Commission Chairman Spear and he promised to take care of the further procedure. (Information received after the meeting: The manuscript has been reviewed by 22 external experts. Comments received from all reviewers were incorporated in the manuscript. The manuscript will be published in Pure and Applied Chemistry. The document is being reviewed by IDCNS).

20. PST-20 Classification and nomenclature of phosphorus compounds (Kizilyalli reported)

The project is still justified. Kizilyalli illustrated the need by quoting several inconsistencies and ambiguities in the phosphate literature. At the previous meeting in Ljubljana, it was decided to contact the nomenclature commission and ask for comments, however no definite opinion was received. Corish contacted the Chairman of nomenclature commission and was advised to produce a list of chemical formulae as examples which may need proper identification. Kizilyalli should prepare the list of examples,

possibly of B/Si/P complex compounds and send it to Chatillon who will contact the nomenclature commission.

#### 21. Potential new projects

"Terminology of vapour deposition". Carlsson should fill in the proposal forms, available on the IUPAC web site.

If the project "Carbonaceous materials" (ITEM # 10) is not finished by the Brisbane meeting, Boehm should fill in the proposal forms.

"Teaching experiments in solid state chemistry" could be a new short term project as a follow - up to the report on the web site (Kizilyalli).

"Surface analysis" may be an important subject provided that proper experts willing to carry it out can be found (Kolar).

"Powder properties" (Particles/clusters, techniques for characterization, segregation on surfaces....) (Carlsson)

"Composites" has been already considered in the past (Baumard 1994)

#### 22. New members

Alan Chadwick was proposed as Titular Member to replace Karl Spear; Meral Kizilyalli was proposed as Titular Member to replace Jacques Livage.

Livage was proposed as associate member to replace Lieber, Mark Allendorf to replace Beno Lux and John Mintmire to replace Chadwick.

The commission received a proposal from the executive secretary J. W. Jost to include a new national representative, Josef Julian Ziolkowski from Poland. The proposal was accepted.

After the meeting, Allendorf informed Rosenblatt that he cannot join the commission due to other obligations. A new expert has to be found.

The list of Commission members is attached to the minutes.

23. HTMC-X in 2000: (Hilpert reported): The conference will be held at Jülich on April 10<sup>th</sup> - 14<sup>th</sup>, 2000. More than 200 abstracts were received. The abstracts are reviewed and authors will be notified about acceptance by October. During the conference, an informal meeting of commission 11.3 will be held to review current activity.

24. HTMC-IX (Rosenblatt reporting): The next conference in the series after the 2000 meeting in Aachen is planned to be held in 2003. Following the tradition of alternating venues, the meeting should be held outside Europe. Rosenblatt, acting for the site selection committee of Hastie, Spear, Corish, Balducci and Rosenblatt, will write to potential organizers in the U.S. and Asia requesting that they submit preliminary proposals. There was some discussion of potential U.S. organizers. Hilpert received a preliminary expression of interest from Prof. Wei Binbo in Xian, China. Koumoto some time ago suggested and forwarded a preliminary expression of interest in organizing the meeting in Japan. The selection committee would welcome additional suggestions for potential sites and organizers for the 2003 HTMC.

25.-

26. Report from the Committee on the teaching of chemistry (CTC) (Kizilyalli reporting): The meeting of CTC was held during the 15<sup>th</sup> Int. Conference on Chemical Education (ICCE) in Cairo on August 12, 1998. Kizilyalli was unable to attend. However, a manuscript of 21 experiments in Solid State Chemistry was received from Kizilyalli and it was recommended to be published on the website. Kizilyalli received minutes of the meeting, which are available on request through e-mail.

27. The meeting of Titular members will take place in September or October 2000 in Ankara, organized by Kizilyalli.

28. At the division open meeting on Tuesday, Chatillon will report on completed projects and on projects close to completion.

## Appendices:

### Appendix A

#### Agenda for Belin Meeting

9:00 MEETING OF TITULAR MEMBERS

10:00 MEETING OF COMMISSION

In absence of Karl Spear, the meeting will be chaired by Gerd Rosenblatt

#### Session 1

- |   |                   |
|---|-------------------|
| 1. Introduction and Announcements   | Secretary         |
| 2. Finalization of Agenda   | Secretary         |
| 3. Minutes of the Ljubljana meeting   | Secretary         |
| 4. Reorganisation of IUPAC, reports on items from the Union and Inorganic Division                            | Corish/Rosenblatt |
| 5. The future of Commission II.3 within the proposed new structure of IUPAC                                   | Corish/Rosenblatt |
| 6. The new division committee and its proposed functions  | Corish/Rosenblatt |
| 7. 230/23/89 Terminology for Diffusion in the Solid State   | Kizilyalli        |
| 8. 230/24/93 Chemical Research Needed to Improve High Temperature Temperature Processing of Advanced Ceramics | Kolar             |
| 9. 230/27/95 Terminology of Vapor Deposition  | Spear             |
| 10. SC-2 (232/1/91) Characterization of Carbonaceous Materials and New Carbons                                | Boehm             |

#### Session 2

- |  |            |
|--|------------|
| 11. PST-18 Calculation of Equilibrium Thermodynamic Properties of High Temperature Superconductors | Voronin    |
| 12. PST-16 Teaching of High Temperature Materials Chemistry at University                          | Balducci   |
| 13. WB-3 Structure and Properties of Ceramic Fibres  | Lewis      |
| 14. 230/9/83 High Temperature Mass Spectrometry Ionisation Cross Sections                          | Chatillon  |
| 15. 230/25/93 Surface Analysis of Ceramics   | Lewis      |
| 16. 230/29/95 Teaching Experiments in Solid State Chemistry  | Kizilyalli |

#### Session 3

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|---|----------|
| 17. TF-20 Terminology Used in Sol-Gel Processing of Advanced Ceramics and Inorganic/Organic Polymeric Substances (pool project) | Holland  |
| 18. PST-19 Thermochemical and Thermophysical Properties of Refractory Metal Carbides  | Balducci |

19. 230/28/95 Terminology of Silicon Nitride Based Ceramics	Metselaar
20. PST-20 Classification and Nomenclature of Phosphorous Compounds	Kizilyalli
21. Potential New Projects	members
22. New members	members
23. Organizational Matters: HTMC-X in 2000	Hilpert
24. Organizational Matters: HTMC-X in 2003	Rosenblatt
25. Contact details and interests of members	secretary
26. Closing Remarks	

## APPENDIX B

### Addresses and Status of Members (12/9/99)

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