

Minutes of IAPWS Thermophysical Properties of Water and Steam WG

Vejle, Denmark 25–28 August 2003

NOTE: Items are listed according to their order on the revised agenda. **Bold print** denotes significant actions taken. For some of the agenda items discussed jointly with the IRS working group, reference is made to those minutes.

1-3. A few additions were made to the preliminary agenda, after which it was adopted. Allan Harvey was appointed Clerk of Minutes. The minutes from the 2002 TPWS WG meeting in Buenos Aires were approved without objection.

4. Dr. Friend reviewed the status of IAPWS documents and highlighted those that would be discussed during the week.

5 The preliminary report on the future of IAPWS was discussed. With regard to specific items affecting TPWS, the following conclusions were reached. **There is no need to change the TPWS name. With regard to suggestions about reducing the length of the IAPWS week, the WG had concerns about any plan that would reduce the amount of time available for the Working Groups, especially for the meeting following the ICPWS where more time might be needed. The WG had no objection to holding the ICPWS at 4-year intervals, provided willing host countries were available.**

Some people were proposed for some of the new committees being formed. **Allan Harvey agreed to serve on *Properties and Formulations for High-Temperature Aqueous Systems*. Bill Parry (GE) and Ingo Weber (Siemens) agreed to check within their companies for possible interest in the *Fuel Cells* Task Group. Bill Parry agreed to serve on *Effectiveness of ICRNs*. Marc Assael agreed to serve on the *Educational* Task Group, and Prof. Watanabe will contact a member of the Japanese delegation who might be interested. Dr. Okita agreed to serve on the *Environmental Issues* Task Group.**

6. Suggestions were made for organizing sessions at the upcoming ICPWS, and were transmitted to the organizing committee.

7-11. For these items, all of which are joint with the IRS Working Group related to different IAPWS products, see the IRS minutes.

12. Mr. Cooper gave a report on the proposed Advisory Note 2 on the role of various IAPWS documents relating to thermodynamic properties of ordinary water. After some

discussion, it was decided that Surface Tension should be added to the document. With some additional editorial changes, the WG was satisfied with the document. **The joint Working Groups TPWS and IRS recommend this document to the EC, and suggest that it be sent for approval by postal ballot in the coming year.**

The issue of obsolete IAPWS documents came up in this discussion (and also for agenda item 11). **It was decided that the Website should have a brief section about obsolete IAPWS documents, which Allan Harvey and Jeff Cooper will prepare.**

13. Jeff Cooper gave a presentation on his study of the effect on the existing formulation for D2O thermodynamic properties of changing the reducing temperatures to the current ITS-90 scale. The WG felt a need to have more time to look at the proposed changes, and at the documentation of their effects. The following schedule was adopted. By the end of 2003, Jeff Cooper will produce a draft of a revised release, and supporting documentation. The WG Chair will circulate this to the D2O Task Group, and then to the WG members by Feb. 15. WG members will have until March 31 to comment. Mr. Cooper will produce a revised version by April 30, which will be reviewed by the Editorial Committee by May 31. Then the WG Chair will send it to the Executive Secretary to be distributed to National Delegates, in anticipation of a vote for approval at the 2004 EC meeting.

14. Jeff Cooper reported that the IEC steam turbine committee was currently dormant due to lack of a chair. He will continue as a liaison.

15. Allan Harvey, chair of the Task Group on this issue, reported that there was **no need to revise the Fundamental Constants guideline this year.**

16-24. A Joint Session was held with PCAS on Tuesday afternoon. The contributions are listed on the Agenda. Item 18 required some action, as approval of a new Guideline on Henry's constants and vapor-liquid distribution constants (replacing two existing Guidelines) was requested. It was decided that some information about uncertainties should be added to the Guideline. **The WGs TPWS and PCAS endorsed the proposed Guideline subject to this revision, and desires that it be sent for postal ballot for EC approval once the revision is made.**

25. Prof. Yasuoka gave a presentation on his molecular dynamics simulations of the ethanol/water interface.

26. Dr. Friend described the progress of the Transport Properties Task Group, which was greatly enhanced by the IAPWS Project that allowed Ifigenia Metaxa to visit NIST in Boulder.

Attachment 5

Allan Harvey described the minor discontinuity that had been discovered in the existing release for the viscosity of ordinary water, and its suggested resolution, which had already been endorsed by the Transport Properties TG. **TPWS approved this minor revision to the viscosity Release and requests the EC to approve the revision at this meeting.**

Marc Assael reported on the work done by I. Metaxa on the IAPWS Collaborative Project on the low-density limit of the viscosity of water. He also described future plans to work toward a new formulation for the viscosity; it is hoped that a preliminary version will be finished by next year's meeting in Kyoto.

P. Kones and R. Mares reported on their evaluation of the equation published by Alexandrov for the viscosity of water and steam. It was the decision of the Transport Properties Task Group that, though the Alexandrov formulation has some good points, it will not be adopted as a new standard, and a new formulation will be adopted instead.

A question was raised about the thermal conductivity, and it was stated that the Task Group would start working on that more seriously as the viscosity project drew nearer to a close.

27. There was no further discussion of EC mandates to the WG in addition to that reported in items 5 and 6 above.

28. Several items left over from Tuesday's joint symposium with PCAS were discussed.

With regard to the project underway in the EU on properties of humid air (item 16), the WG chair will write a letter to the Chair of this part of the project ("Working Package 4") expressing the interest of TPWS in this area to see if any mutually beneficial interactions can be developed.

With regard to the proposal by V. Mayer for development of recommended data values of hydration properties of organic solutes (item 21), Allan Harvey was appointed to represent TPWS in discussions of this project.

With regard to the proposed compilation by V. Valyashko on high-temperature experimental data for aqueous mixtures, the WG had concerns about IAPWS involvement at this late stage in the project and about the lack of data evaluation. Marc Assael and Anneke Levelt Sengers were appointed to discuss these issues with Prof. Valyashko before deciding on any further steps.

29. The Chair reminded the WG of the usefulness of collaborative projects and invited them to think of ideas for next year.

30. Under this item, there was discussion of the Simulation Task Group, which does not appear to have accomplished much toward its goals. **In the absence of the TG chair, it was suggested that Prof. Yasuoka lead the effort for the next year (looking toward the ICPWS in Kyoto) toward finding fruitful directions for simulation for IAPWS.** The WG Chair will write a letter to the previous TG Chair expressing thanks for his service and inviting him to contribute in the future. Since this TG is joint with PCAS, Dr. Friend will consult the PCAS Chair to be sure this course of action is acceptable to that WG.

31. **Dr. Kenji Yasuoka (Japan) and Dr. Radim Mares (Czech Republic) were proposed to become members of TPWS, and were unanimously approved. It was also noted that Prof. Roland Span (Germany) had been added to the WG last year, but that this was not reflected in the IAPWS membership roster. In response to the request of the IAPWS President to examine the status of inactive members, 4 members were identified to be contacted to see if they wish to continue. Prof. Wagner will contact Schiebener (Germany) and Mayinger (Germany). The British and Irish Committee will contact Watson (BIAPWS). Dr. Friend will contact Agayev (Azerbaijan).**

32. There was no further new business.

33-34. The Chair and Clerk of Minutes were authorized to prepare the motion to the EC and the report to the meeting of all Working Groups, and the meeting was adjourned.