

PCAS WG Minutes

Banff, Canada, September 29 – October 4, 2019

Present:

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PCAS separate meeting, 09/30 morning

Clerk of minutes has been appointed: Andre Anderko

PCC/PCAS Joint meeting, 09/30 morning and afternoon.

The session focused on film-forming substances. The following presentations have been given: Barry Dooley – Introduction of Technical Guidance Documents (TGDs). 10 TGDs have been presented.

Wolfgang Hater – Durability of Protective OLDA Films

Hayden Henderson - The AGL experience with Film-Forming Substances

Kristine Liao - Film Forming Product Qualification at Darlington Nuclear Generation Station

PCAS separate meeting, 09/30 afternoon

Agenda has been approved with the addition of Tomáš Němec's presentation for Tuesday.

Minutes of the 2018 meeting have been approved.

The group members gave an overview of their PCAS-related research activities during the past year.

Possible ICRNs have been discussed. Peter Tremaine proposed the following two new ICRNs:

- (1) Development of an improved thermodynamic model for the NaCl-H₂O system that would incorporate the current formulation for the dielectric constant of H₂O and ultimately replace the well-known model of Donald Archer.
- (2) Development of an equation for the dielectric constant of D₂O. It has been noted that TPWS is working on a formulation for the viscosity of D₂O, but there is also a need for an analogous formulation for the dielectric constant.

No international collaborations have been proposed.

Joint session with TPWS, 09/30 afternoon

The following presentations have been given:

Allan Harvey – Revision of the IAPWS 95 EOS. A new ICRN (ICRN 31) is being created.

Jana Kalova, presented by Allan Harvey – Report of Task Group on Surface Tension of Ordinary Water

PCAS/IRS joint meeting, 10/01 morning

Nobuo Okita introduced the work of the task group on categories of industrial requirements. After the introduction, the following presentations have been made:

Shigeki Senoo - Report of the Task Group “Wet Steam Data from Operating Turbines” (N. Okita, A. Nový, I. Weber, S. Senoo). S. Senoo explained the research requirements for predicting the effects of coarse droplets on blade erosion in steam turbines. The research goal is the reduction of erosion in steam turbines.

Nobuo Okita - Report of the Task Group “Categories of industrial requirements” (N. Okita, A. Nový, I. Weber, A. Anderko, M. Rziha, R. Span). N. Okita summarized the progress since the last IAPWS meeting in 2018 and explained three examples of the requirements:

- 1) Wet steam properties in steam turbines
- 2) Acid dew points under low sulfur contents for HRSG design.
- 3) Geothermal steam turbine cycle with non-condensable gas and impurities

Discussion of future activities of PCAS: Progress on guidelines have been discussed. The guideline on self-diffusion coefficients of H₂O (led by K. Yoshida) is in an advanced stage. Work on the guideline on amines (led by J. Bellows) has not progressed since the last meeting and no update is available due to Jim Bellows' absence.

After the discussion, the following presentation has been made:

Andre Anderko - Modeling aqueous solution chemistry for water treatment applications. This presentation focused on the thermodynamic behavior of humic substances.

PCC/PCAS joint meeting, 10/01 afternoon

The meeting was focused on film-forming amines. The following presentation has been made:

Barry Dooley – Influences of FFS Films on Oxide Growth Mechanisms around Generating Cycles

PCAS separate meeting, 10/01 afternoon

The following presentation has been made:

Tomáš Němec – Catalyst Nanoparticle Synthesis by Spark Discharge

TPWS/PCAS joint meeting, 10/03 morning

The following presentations have been made:

A. Harvey - Report and official WG consideration of minor revision of Release on the Ionization Constant of H₂O

K. Yoshida - Report on progress toward IAPWS Guideline on diffusivity of ordinary water (K. Yoshida, F. Caupin, A. Harvey, R. Hellmann, M. Huber)

K. Meier - Cross second virial coefficients for industrially and scientifically important mixtures of water vapor and simple gases from ab initio intermolecular potentials (R. Hellmann, K. Meier)

T. Němec - Nucleation in water vapor: Classical nucleation theory and molecular simulation

PCAS separate meeting, 10/03 afternoon

The following presentation has been given to expand on Vaclav Vins's Helmholtz Award lecture:

Václav Vinš - Density and Surface Tension of Binary Aqueous Mixtures with Special Focus on Low Temperatures

PCAS Membership: Invitation has been extended to Vaclav Vins and Jane Ferguson to join PCAS. K. Yoshida informed the group that Anneke Levelt-Sengers will be unable to continue her membership in PCAS.

Preparation of report for the Executive Committee: The group discussed the report to the Executive Committee. The main parts of the report are (1) the preparation of guidelines and (2) membership. For the guidelines, it has been decided to defer further discussion of the amine guideline until James Bellows is able to comment on his progress.