

## Minutes of SCSW: Banff, Oct/2019

Chair: R. Pawlowicz

Clerk of Minutes: S. Seitz.

**NB: These minutes include agenda items in the joint TPWS/SCSW/IRS agenda that are specifically oriented to SCSW. For other 2018 agenda items consult the minutes of the other WG.**

9. Report of Task Group on Extension of Range of Formulation for Thermodynamic Properties of Sea Water: (R. Feistel)

Although more data are available, there does not yet appear to be a pressing immediate need for a new formulation that will be valid at high temperatures and high salinities. RF is transitioning to retirement and will not continue to work on a new formulation, but suggests that people from the desalination industry might be interested and should be contacted to see if they might continue to work on the topic. RF proposed that the taskgroup be closed until someone is found to lead work.

10.1 IAPWS/IAPSO/SCOR Joint Committee on Seawater, including updates to TEOS-10 (R. Pawlowicz)

RP presented an update on the work of JCS, including the statistics of downloads from various items at [www.teos-10.org](http://www.teos-10.org). Results of the JCS workshops, held at the ICPWS in Prague last year, were also described. As per its terms of reference, JCS requires re-approval at 6 year intervals. JCS proposed that a) JCS continue, b) the JCS terms of reference remain unchanged for the next cycle, and c) the updated membership be approved. An SCSW/TPWS vote was held and this was approved unanimously for presentation to the Executive.

11.1 Proposed Guideline on Surface Tension of seawater (K. Nayar, A. Harvey)

The proposed guideline in the surface tension of seawater was presented

11.2 Evaluation Report on proposed Guideline (R. Feistel, M. Duska)

The Evaluation committee, after examining the proposed guideline, found no mathematical errors.

11.3 Formal Working Group consideration of the Guideline

A number of editorial points were raised, including the statement of uncertainties in Table 1, a definition of the coverage factor for the expanded uncertainty, a statement about pressure dependence, the relation to saturation conditions, and the location of Table 3 (in an Appendix or not). The WG voted to accept the guideline and move it forward to the EC, subject to editorial revision on these points.

11.4 Density measurements of IAPSO standard seawater by single sinker hydrostatic weighing at atmospheric pressure (A. Giuliano Albo, S. Lago, Y. Kayukawa)

Progress has been made in a cooperation between metrologists in Japan and Italy. Fundamentally, INRIM has still problems with measurement errors (bubbles, etc.) and the uncertainty is large. However, their measurement appear to suggest that SSW densities are larger than those predicted by TEOS-10, this is in contrast to recent vibrating tube densimeter measurements which appear to show SSW densities smaller than those predicted by TEOS-10.

**(the following 4 items were presented out of order so that PCAS members could attend)**

11.7 Report on pH (S. Seitz)

An update was given on work by SCOR WG 145 and their plans for a meeting in Feb 2020. SS also provided information about the new European Metrological Network for earth sciences, which includes ocean sciences.

11.8 Progress towards pH Traceability (F. Camoes)

A presentation was given on issues related to 'pH' and 'pH<sub>T</sub>' scales.

11.9 Liquid Junction Potentials and pH (R. Pawlowicz)

RP presented work on calculated Liquid Junction Potentials using the MIN3P 'reactive mass transport' numerical code. This approach can potentially provide guidance to many issues, but in spite of its critical importance in potentiometric techniques for pH determination there are very few measurements available for comparison.

11.10 SI-Traceable Measurement of Relative Fugacity (R. Feistel, J. Lovell-Smith)

RF presented some recently published work that (in theory at least) allowed for a SI traceable measurement of relative fugacity using new carbon nanotube membranes which can pass water but block all other materials dissolved in water/

11.5 Density of seawater at low temperatures (including supercooled seawater) and high pressures (A. Blahut, J. Hykl, P. Peukert, V. Vinš, J. Hrubý)

Differential measurements of seawater density in a two-capillary-tube system in which the meniscus height was measured were presented,

11.6 Seawater Density Anomalies in the Eastern Central Atlantic (S. Weinreben, R. Feistel)

RF presented recently published measurements of density measurements in the tropical Atlantic. Measurements were lighter than TEOS-10, but no correlation could be found between the measurements and any oceanographic or technical variations. Samples in some years were analyzed on the vessel; in other years in the lab..

14.2 (Not in the Agenda)

It was pointed out that ICRN 16 "Thermophysical Properties of seawater" expires in 2019. This ICRN had originally been written in 2007, and renewed in 2011 and 2014. All agreed (by vote) that although the Research Need continues, changes to the text and an updating of references was needed. A discussion occurred as to whether it would be more helpful to just revise and extend the existing ICRN, or to close it and issue a new one.

By a majority vote it was concluded that a) the present ICRN should be closed at the 2020 meeting, when a closing statement would be issued, and b) that a new ICRN should be brought up for approval at that same date. A task group is formed (chair: Pawlowicz members: Feistel, Seitz, Camoes, Kayukawa, Harvey)

Issue to be considered: the new title and scope, proposal for scope: thermophysical properties and pH related issues, plus instrumental issues.

17. Membership

New member:

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20. Preparation of the Formal Motion to the EC

21. Adjournment

Oct 4, 2019

R. Pawlowicz (Chair)