CCT/12-23

Report of Working Group 6 on Humidity Measurements to the 26th meeting of the CCT, 2012

Membership:

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H. Abe replaces H. Kitano. S. Oğuz Aytekin replaces A. Kartal Dogan.

WG6 terms of reference:

The terms of reference of WG6 are:

–to advise the CCT on matters relating to humidity;
–to pursue harmonisation relevant to the field of humidity measurement
–To develop and maintain effective liaison with international humidity and moisture community.

Tasks of WG6:

–operation of CCT-K6;
–strategic planning of ongoing and future key and supplementary comparisons in the field;
–clarification of quantities, units, symbols and realisations relating to humidity measurement;
–production of the document on uncertainty in humidity;
–coordination with CCQM in areas of trace moisture in gases, and moisture in materials, as required
and
–to convene the International Symposium on Humidity and Moisture (ISHM).

Working Group 6 met in June 2010 at TEMPMEKO & ISHM 2010, and at BIPM on 21 May 2012, as well as working routinely by e-mail.

The Working Group has progressed tasks as follows:

CCT-K6

A Draft A report of key comparison CCT-K6 has been circulated to participants, and has been initially discussed in a closed meeting of participants on 21 May and also by e-mail. Discussion continues about how to finalise the treatment of some details before producing Draft B and linkages to other relevant key comparisons. No controversial comments have been received so far. The exceptionally long running time (approximately 7 years for measurements) was largely due to a high number of

instrument breakdowns, repairs, and additional checks; plus (unconnected) queries from participants about suspected measurement problems.

Other comparisons in progress or planned in humidity field

CCT-K6.1 bilateral to K6 (MSL-NPL) measurements are completed and Draft A report is in preparation.

EURAMET.T-K6.1 (FSBLPM-MIKES) is at Draft B review stage.

SIM bilateral key comparisons SIM.T-K6.1 (NIST/NRC), and SIM.T-K6.3 (NIST/INMETRO) measurements are completed, and SIM.T-K6.2 (NIST/CENAM) is at Draft B review stage.

A COOMET.T-K6 is in planning.

CCT-K8, EURAMET.T-K8 and APMP.T-K8 (high dew-point range above 30 °C) have all been planned with coordination between comparisons, and all are progressing (CCT-K8 at protocol stage, APMP-K8 measurements started, and EURAMET.T-K8 measurements well advanced. A SIM.T-K8 is also proposed). CCT-K8 participants have been agreed. Two transfer standards owned by pilot INTA have been characterised, and the protocol is almost completed. Participant measurements are planned to start early 2013.

The need for a key comparison covering humidity from dew-point below –50 °C down to trace humidities remains under discussion. A EURAMET (non-KCDB-registered) comparison of trace moisture in gas, down to amount fraction of 10 nmol/mol (by NIST, PTB, NMIJ, NPL), has been completed and provides some insight into methodology for comparisons in this range.

Quantities, units, symbols and realizations relating to humidity measurement

Work continues on an internationally-agreed set of terms and definitions for humidity quantities. This draws on several national published standards, which are not yet harmonised. New cooperation with IAPWS (International Association on Properties of Water and Steam) is beginning to give an opportunity for them to make valuable input to this task, which is of strong interest to IAPWS.

Production of the document on uncertainty in humidity

Work continues on producing detailed and authoritative guidance on evaluation of uncertainty for NMI-level humidity standards and calibrations.

Coordination with CCQM in areas of trace moisture in gases, and moisture in materials, as required.

Inter-CC coordination in the area of trace moisture in gases continues at an informal low level.

In the area of moisture in materials, there has been active liaison between WG6 and CCQM IAWG, on measurement of grain moisture, and the need for recognised traceability and a key comparison in this area.

There is also growing level of activity on moisture in materials in some RMOs.

Convening of the International Symposium on Humidity and Moisture (ISHM).

In June 2010 ISHM was held as a joint event with TEMPMEKO, as TEMPMEKO & ISHM 2010, hosted in Slovenia by MIRS/UL/FE-LMK. WG6 supplied the humidity Co-chair of the International Programme Committee, one member of the Steering Committee, and several members of the International Programme Committee. The humidity proceedings volume (special issue of the International Journal of Thermophysics) is near to completion. The joint event was generally very satisfactory for the ISHM "community" and although WG6 decided to defer the next ISHM a little longer (not joint with TEMPMEKO 2013), options remain open for either a joint event or a separate ISHM next time.

Liaison with other relevant bodies

A delegate from IAPWS attended meetings of WG6 in both 2010 and 2012. There are considerable shared interests and humidity is expected to be a key area for developing BIPM-IAPWS cooperation. Cooperation with WMO is also a prospect.

Stephanie Bell
Chairman, CCT/WG6
22 May 2012