


KHARKOV NATIONAL UNIVERSITY OF RADIO ELECTRONICS
NATIONAL SCIENTIFIC CENTRE "INSTITUTE OF METROLOGY"
TECHNICAL UNIVERSITY-SOFIA
UNION OF THE METROLOGISTS IN BULGARIA

UM-2023

XX International Scientific and Technical Seminar "Uncertainty in Measurement: Scientific, Normative, Applied and Methodical Aspects"

THESES OF REPORTS

November 27-28, 2023

Content

PECULIARITIES OF MEASUREMENT RESULTS PROCESSING WHEN CALIBRATING HYGROMETERS

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Various types of hygrometers are widely used to measure of the gas's humidity. Hygrometers must be calibrated to traceability ensure of humidity measurement results to SI units. At the same time, in accordance with the requirements of ISO/IEC 17025:2019 [1], the laboratory must have a procedure for measurement uncertainty evaluating.

The most common hygrometer calibration scheme involves comparing the readings of the calibrated and reference hygrometers using a comparison device – a humidity generator. Such a scheme requires taking into account the correlation between the measuring results of the calibrated and reference hygrometers while simultaneously measuring the humidity in the generator chamber [2].

The calibration scheme and a mathematical model describing it are presented. The procedure for the measurement uncertainty evaluation at hygrometer calibration by the method of comparison with a reference hygrometer is given, taking into account the possible correlation between the readings [3]. An example of measurement uncertainty evaluation at hygrometer calibration in the metrological laboratory NPP "Kozloduy" is considered.

The need to calibrate a large number of hygrometers used for environmental monitoring in a large industrial plant such as Kozloduy NPP requires an increase in calibration performance. The issues of increasing the hygrometer calibration productivity associated with the processing of measurement results are investigated. The possibility of using the characteristics of the range of a sample of observations [4] for evaluation the numerical value of the measurand and its standard uncertainty of type A is substantiated.

References

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UNCERTAINTY IN MEASUREMENT: SCIENTIFIC, NORMATIVE, APPLIED AND METHODICAL ASPECTS (UM-2023)

Theses of reports of XX International Scientific and Technical Seminar

Издателство Софтрейд, България
ISBN 978-954-334-256-3