



GUIDE 32

Calibration in analytical chemistry and use of certified reference materials

First edition 1997

Foreword

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Draft Guides adopted by the responsible Committee or Group are circulated to national bodies for voting. Publication as a Guide requires approval by at least 75 % of the national bodies casting a vote.

ISO Guide 32 was prepared by the ISO Committee on Reference Materials (REMCO).

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Introduction

Within the framework of the International Laboratory Accreditation Conference (ILAC), held in Torino (Italy) in October 1990, a one-day technical seminar was devoted to *Metrology in testing* where the various aspects of metrological traceability in different fields of testing were addressed.

In order to clarify the implementation of the principles of metrological traceability in chemistry, it was then requested that an ILAC Guide be established on *Calibration in analytical chemistry and use of certified reference materials*.

A draft was established which, after amendments by an ILAC Working Group, was approved by the 1992 ILAC Conference in Ottawa (Canada). Moreover, due to a worldwide need for such information, it was further recommended to transmit this draft to ISO/REMCO to serve as basis for development of an ISO Guide. This proposal was accepted by ISO/REMCO.

Finalization of this Guide was carried out by ISO/REMCO Task Group 2, *Calibration*.

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1 Scope

Quality assurance in a testing laboratory, particularly in the case of its assessment (see ISO/IEC Guide 25), highlights the need to consider closely the question of the accuracy of its measurements and analytical results, and to ensure that the principles necessary to establish demonstrated accuracy have not been omitted.

The calibration of the parameters associated with chemical analyses and material testing deserves particular attention, because major errors can be made by neglecting or ignoring the basic principles of metrology which also apply to these areas. This Guide identifies a number of general recommendations for those who, either in laboratories or as assessors, are faced with this problem.

2 References

ISO/IEC Guide 25:1990, *General requirements for the competence of calibration and testing laboratories*.

ISO Guide 30:1992, *Terms and definitions used in connection with reference materials*.

ISO Guide 31:1981, *Contents of certificates of reference materials*.

ISO Guide 33:1989, *Uses of certified reference materials*.

ISO Guide 34:1996, *Quality system guidelines for the production of reference materials*.

ISO Guide 35:—¹, *Certification of reference materials — General and statistical principles*.

VIM:1993, *International vocabulary of basic and general terms in metrology*. BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, OIML.

Guide to the expression of uncertainty in measurement. 1st edition, 1993 (corrected and reprinted 1995).

3 Basic considerations

Any measurement, particularly any quantitative chemical analysis, shall employ reference elements to ensure demonstrated traceability to the relevant basic quantities. This is an essential condition for the accuracy of the results.

The metrological quality of the calibration performed depends on:

¹ To be published. (Revision of ISO Guide 35:1989)