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Capability of detection —

Part 2:
Methodology in the linear calibration case

Capacité de détection —

Partie 2: Méthodologie de l'étalonnage linéaire

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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International Standard ISO 11843-2 was prepared by Technical Committee ISO/TC 69, *Applications of statistical methods*, Subcommittee SC 6, *Measurement methods and results*.

ISO 11843 consists of the following parts, under the general title *Capability of detection*:

⎯ *Part 1: Terms and definitions*

⎯ *Part 2: Methodology in the linear calibration case*

Annex A forms a normative part of this part of ISO 11843. Annexes B and C are for information only.

Introduction

An ideal requirement for the capability of detection with respect to a selected state variable would be that the actual state of every observed system can be classified with certainty as either equal to or different from its basic state. However, due to systematic and random distortions, this ideal requirement cannot be satisfied because:

⎯ in reality all reference states, including the basic state, are never known in terms of the state variable. Hence, all states can only be correctly characterized in terms of differences from basic state, i.e. in terms of the net state variable.

In practice, reference states are very often assumed to be known with respect to the state variable. In other words, the value of the state variable for the basic state is set to zero; for instance in analytical chemistry, the unknown concentration or the amount of analyte in the blank material usually is assumed to be zero and values of the net concentration or amount are reported in terms of supposed concentrations or amounts. In chemical trace analysis especially, it is only possible to estimate concentration or amount differences with respect to available blank material. In order to prevent erroneous decisions, it is generally recommended to report differences from the basic state only, i.e. data in terms of the net state variable;

NOTE   In the ISO Guide 30 and in ISO 11095 no distinction is made between the state variable and the net state variable. As a consequence, in these two documents reference states are, without justification, assumed to be known with respect to the state variable.

⎯ the calibration and the processes of sampling and preparation add random variation to the measurement results.

In this part of ISO 11843, the following two requirements were chosen:

⎯ the probability is α of detecting (erroneously) that a system is not in the basic state when it is in the basic state;

⎯ the probability is β of (erroneously) not detecting that a system, for which the value of the net state variable is equal to the minimum detectable value (x_d), is not in the basic state.