

## Reading List for Analytical Scientists

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## Introduction and scope

This reading list has been prepared by members of the Eurachem Education and Training Working Group. It is based on bibliographies originally produced by TrainMiC and LGC – under the UK's Chemical and Biological Metrology programme ([www.lgcgroup.com/nmi](http://www.lgcgroup.com/nmi)) – but has been substantially updated. The main focus of the references contained in the list is metrology in chemistry, with a particular focus on quality assurance. However, it is anticipated that the references will also be of interest to those working in other disciplines. It is not intended to be a comprehensive list of all publications relating to quality in analytical measurement. The aim is to provide references to a selection of websites, standards, guides and books which will hopefully be of use to all those involved with chemical analysis (and related disciplines), including laboratory staff, students, lecturers and trainers.

Many of the references provided in this list are available to download free of charge, in particular documents published by Eurachem, JCGM, Euramet, Eurolab, ILAC, EA and accreditation bodies such as UKAS.

The aim is to update the bibliography annually. The Working Group welcomes suggestions for additions to the bibliography. Please send any additional references to the Working Group Chair (<http://www.eurachem.org/index.php/component/contact/contact/60-ct-exec/10-execvjb>).

Eurachem provides this list for information and is not responsible for the content or advice given in the resources listed.

## Introduction to metrology and terminology

### Websites and web resources

- CIPM Mutual recognition arrangement (MRA) of national measurement standards and of calibration and measurement certificates issued by national metrology institutes ([www.bipm.org/en/cipm-mra/](http://www.bipm.org/en/cipm-mra/))
- ISO online browsing platform – access ISO standards, terms and definitions ([www.iso.org/obp/ui/](http://www.iso.org/obp/ui/))
- VIM Definitions with Informative Annotations, JCGM-WG2 (<http://jcgm.bipm.org/vim/en/index.html>)

### Standards

- BIPM, IEC, IFCC, ILAC, ISO, IUPAC, IUPAP, OIML. JCGM 200:2012 (JCGM 200:2008 with minor corrections), International vocabulary of metrology -- Basic and general concepts and associated terms (VIM3) ([www.bipm.org](http://www.bipm.org)) (Earlier version printed as ISO Guide 99:2007 ([www.iso.org](http://www.iso.org)))
- ISO 80000-1:2009. Quantities and units -- Part 1: General ([www.iso.org](http://www.iso.org))

### Guides

- V. Barwick, E. Prichard (Eds), Terminology in analytical measurement – Introduction to VIM3, Eurachem, 2011, ISBN 978 0 948926 29 7 ([www.eurachem.org](http://www.eurachem.org))
- A beginner's guide to measurement, v3, Good practice guide no. 118, NPL, 2010, ISSN: 1368-6550 ([www.npl.co.uk](http://www.npl.co.uk))
- Metrology – In short, 3<sup>rd</sup> Edition, EURAMET, 2008 ([www.euramet.org](http://www.euramet.org))

- The International System of Units (SI), 8<sup>th</sup> Edition, 2006 (updated in 2014) ([www.bipm.org](http://www.bipm.org))

### **Books**

- IUPAC Compendium of chemical terminology ('Gold Book'), 2007 (updated version available at <http://goldbook.iupac.org>)
- IUPAC Quantities, units and symbols in physical chemistry ('Green Book'), 3<sup>rd</sup> Edition, 2007, ISBN 978-0-85404-433-7 ([www.iupac.org/fileadmin/user\\_upload/publications/e-resources/ONLINE-IUPAC-GB3-2ndPrinting-Online-Sep2012.pdf](http://www.iupac.org/fileadmin/user_upload/publications/e-resources/ONLINE-IUPAC-GB3-2ndPrinting-Online-Sep2012.pdf))
- E. Prichard, Analytical measurement terminology, RSC, 2001, ISBN 0 85404 443
- IUPAC Compendium of analytical nomenclature, ('Orange Book'), 3<sup>rd</sup> Edition, 1997, ISBN 0-86542-615-5 ([http://old.iupac.org/publications/analytical\\_compendium/](http://old.iupac.org/publications/analytical_compendium/))

### **Articles and reports**

- Eurachem information leaflet
  - You talk, we understand – The way out of the tower of Babel [An introduction to measurement terminology] (2015) ([www.eurachem.org](http://www.eurachem.org))
- APLAC TC 011, Why are these test results so different? The importance of testing methods in chemical and microbiological testing, Issue No, 2 09/10 ([www.aplac.org](http://www.aplac.org))
- R.I. Wielgosz, International comparability of chemical measurement results, Anal. Bioanal. Chem., 2002, 374, 767-771 ([www.springer.com](http://www.springer.com))
- W. Horwitz, Nomenclature for sampling in analytical chemistry, Pure and Appl. Chem., 1990, 62, 1193-1208 ([www.iupac.org](http://www.iupac.org))
- AMC Technical Briefs, RSC, ([www.rsc.org/Membership/Networking/InterestGroups/Analytical/AMC/TechnicalBriefs.asp](http://www.rsc.org/Membership/Networking/InterestGroups/Analytical/AMC/TechnicalBriefs.asp)):
  - AMC TB 76-2016, Chemical metrology
  - AMC TB 19-2005, Terminology – the key to understanding analytical science. Part 2: Sampling and sample preparation
  - AMC TB 13-2003, Terminology - the key to understanding analytical science. Part 1: Accuracy, precision and uncertainty

## Traceability of measurement results

### Standards

- ISO 8466-1:1990 Water quality -- Calibration and evaluation of analytical methods and estimation of performance characteristics -- Part 1: Statistical evaluation of the linear calibration function ([www.iso.org](http://www.iso.org))
- ISO 8466-2:2001 Water quality -- Calibration and evaluation of analytical methods and estimation of performance characteristics -- Part 2: Calibration strategy for non-linear second-order calibration functions ([www.iso.org](http://www.iso.org))
- ISO 11095:1996 Linear calibration using reference materials ([www.iso.org](http://www.iso.org))
- ISO 17511:2003. In vitro diagnostic medical devices -- Measurement of quantities in biological samples -- Metrological traceability of values assigned to calibrators and control materials ([www.iso.org](http://www.iso.org))
- ISO 18153:2003. In vitro diagnostic medical devices -- Measurement of quantities in biological samples -- Metrological traceability of values for catalytic concentration of enzymes assigned calibrators and control materials ([www.iso.org](http://www.iso.org))
- ISO/TS 28037:2010. Determination and use of straight-line calibration functions ([www.iso.org](http://www.iso.org))

### Guides

- Calibration of weighing machines, LAB 14, Edition 5, UKAS, 2015 ([www.ukas.com](http://www.ukas.com))
- Guidelines on the calibration of non-automatic weighing instruments, cg-18 Version 4.0, EURAMET, 11/2015, ([www.euramet.org](http://www.euramet.org))
- N. Majcen, P. Taylor, T. Martišius, A. Menditto, M. Patriarca, Practical examples on traceability, measurement uncertainty and validation in chemistry Vol 2, 2011, European Commission, Joint Research Centre (<https://bookshop.europa.eu/en/home/>)
- N. Majcen, P. Taylor, Practical examples on traceability, measurement uncertainty and validation in chemistry Vol 1, 2010, European Commission, Joint Research Centre (<https://bookshop.europa.eu/en/home/>)
- Traceability: Volumetric apparatus, LAB 15 Edition 2, UKAS, 2009 ([www.ukas.com](http://www.ukas.com))
- V. Barwick, S. Wood (Eds), Meeting the traceability requirements of ISO 17025: An analyst's guide, 3<sup>rd</sup> Edition, 2005 ([www.lgcgroup.com/nmi](http://www.lgcgroup.com/nmi))
- Traceability in chemical measurement – A guide to achieving comparable results in chemical measurement, Eurachem/CITAC, 2003 ([www.eurachem.org](http://www.eurachem.org))
- V. Barwick, Preparation of calibration curves: A guide to best practice, LGC/VAM/2003/032, LGC, 2003 ([www.lgcgroup.com/nmi](http://www.lgcgroup.com/nmi))

### Books

- A.Moutzoglou, A.Kastania and S.Archonakis, Laboratory Management Information Systems – Current Requirements and Future Perspectives, IGI Global, 2014, ISBN 978-1-4666-6320-6
- P. De Bièvre, H. Günzler (Eds), Traceability of chemical measurement, Springer-Verlag, Heidelberg Berlin, 2005, ISBN 3642078834

## **Articles and reports**

- F. Raposo, Evaluation of analytical calibration based on least-squares linear regression for instrumental techniques: A tutorial review, TRAC-Trend. Anal. Chem., 2016, 77, 167-185 ([www.elsevier.com](http://www.elsevier.com))
- P. De Bièvre, R. Dybkaer, A. Fajgelj, D. Brynn Hibbert, Metrological traceability of measurement results in chemistry: Concepts and implementation (IUPAC Technical Report), Pure Appl. Chem., 2011, 83 (10), 1873-1935 ([www.iupac.org](http://www.iupac.org))
- Clinical and Laboratory Standards Institute, Metrological traceability and its implementation: a report, Joint IFCC-CLSI project, CLSI document, EP32-R (Formerly X05-R). CLSI, Wayne, Pennsylvania, USA, 2006 (Sample available from [www.ifcc.org](http://www.ifcc.org) or [www.clsi.org](http://www.clsi.org))
- K. Danzer, M. Otto, L. A. Currie, Guidelines for calibration in analytical chemistry, Part 2: Multispecies calibration, IUPAC Technical Report, Pure Appl. Chem., 2004, 76 (6), 1215-1225 ([www.iupac.org](http://www.iupac.org))
- L. Cuadros-Rodriguez, L. Gamiz-Gracia, E. Almansa-Loèpez, J. Laso-Sanchez, Calibration in chemical measurement processes: 1. A metrological approach, TRAC-Trend. Anal. Chem., 2001, 20 (4), 195-206 ([www.elsevier.com](http://www.elsevier.com))
- C. D. Ehrlich, S. D. Rasberry, Metrological timelines in traceability, J. Res. Natl. Inst. Stand. Technol., 1998, 103, 93-105 ([www.nist.gov](http://www.nist.gov))
- K. Danzer, L. A. Currie, Guidelines for calibration in analytical chemistry part 1: Fundamentals and single component calibration, IUPAC Recommendation 1998, Pure Appl. Chem., 1998, 70 (4), 993-1014 ([www.iupac.org](http://www.iupac.org))
- Eurachem information leaflet
  - Metrological traceability of analytical results (2005, updated 2008) ([www.eurachem.org](http://www.eurachem.org))

## Uncertainty of measurement

### Standards

- BIPM, IEC, IFCC, ISO, IUPAC, IUPAP, OIML JCGM 100:2008, Evaluation of measurement data – Guide to the expression of uncertainty in measurement (GUM 1995 with minor corrections) ([www.bipm.org](http://www.bipm.org)) (Printed as ISO/IEC Guide 98-3:2008 ([www.iso.org](http://www.iso.org)))
- JCGM has produced a number of supplements to accompany the GUM, available at [www.bipm.org](http://www.bipm.org):
  - Evaluation of measurement data – The role of measurement uncertainty in conformity assessment, JCGM 106:2012
  - Evaluation of measurement data – Supplement 2 to the "Guide to the expression of uncertainty in measurement" – Extension to any number of output quantities, JCGM 102:2011
  - Evaluation of measurement data – An introduction to the "Guide to the expression of uncertainty in measurement" and related documents, JCGM 104:2009
  - Evaluation of measurement data – Supplement 1 to the "Guide to the expression of uncertainty in measurement" – Propagation of distributions using a Monte Carlo method, JCGM 101:2008
- ISO 11352:2012 Water quality -- Estimation of measurement uncertainty based on validation and quality control data ([www.iso.org](http://www.iso.org))
- ISO 21748:2010. Guidance for the use of repeatability, reproducibility and trueness estimates in measurement uncertainty estimation ([www.iso.org](http://www.iso.org))
- ISO/TS 28037:2010 Determination and use of straight line calibration functions ([www.iso.org](http://www.iso.org))
- ISO/TS 21749:2005. Measurement uncertainty for metrological applications -- Repeated measurements and nested experiments ([www.iso.org](http://www.iso.org))

### Guides

- The expression of uncertainty in testing, LAB 12, Edition 2, UKAS, 2016 ([www.ukas.com](http://www.ukas.com))
- Guidelines for estimating and reporting measurement uncertainty of chemical test results, Technical Note 33, NATA, 2016 ([www.nata.com.au](http://www.nata.com.au))
- R. Bettencourt da Silva, A. Williams (Eds), Setting and using target uncertainty in chemical measurement, Eurachem/CITAC, 2015, ISBN 978-989-98723-7-0 ([www.eurachem.org](http://www.eurachem.org))
- N. Majcen and V Gegevičius (Ed.), Analytical measurement: measurement uncertainty and statistics, 2012, European Commission, Joint Research Centre, ISBN 978-92-79-23071-4 (<https://bookshop.europa.eu/en/home/>)
- S. L. R. Ellison, A. Williams (Eds), Quantifying uncertainty in analytical measurement, 3<sup>rd</sup> Edition, Eurachem/CITAC, 2012, ISBN 978-0-948926-30-3 ([www.eurachem.org](http://www.eurachem.org))
- The expression of uncertainty and confidence in measurement, M3003, Edition 3, UKAS, 2012 ([www.ukas.com](http://www.ukas.com))
- B. Magnusson, T. Näykki, H. Hovind, M. Krysell, Handbook for calculation of measurement uncertainty in environmental laboratories, Nordtest Report TR 537 ed 3.1:2012 ([www.nordtest.info](http://www.nordtest.info))
- N. Majcen, P. Taylor, T. Martišius, A. Menditto, M. Patriarca, Practical examples on traceability, measurement uncertainty and validation in chemistry Vol 2, 2011, European Commission, Joint Research Centre (<https://bookshop.europa.eu/en/home/>)

- N. Majcen, P. Taylor, L. Benedik, Practical examples on traceability, measurement uncertainty and validation in chemistry Vol 1, 2010, European Commission, Joint Research Centre (<https://bookshop.europa.eu/en/home/>)
- APLAC TC 010, General information on uncertainty of measurement, Issue No. 2, 09/10 ([www.aplac.org](http://www.aplac.org))
- APLAC TC 005, Interpretation and guidance on the estimation of uncertainty of measurement in testing, Issue No. 4, 09/10 ([www.aplac.org](http://www.aplac.org))
- APLAC TC 004, Method of stating test and calibration results and compliance with specification, Issue No. 4, 09/10 ([www.aplac.org](http://www.aplac.org))
- ILAC-G8:03/2009, Guidelines on the reporting of compliance with specification ([www.ilac.org](http://www.ilac.org))
- S. L. R. Ellison, A. Williams, Use of uncertainty information in compliance assessment, Eurachem/CITAC, 2007 ([www.eurachem.org](http://www.eurachem.org))
- M. H. Ramsey, S. L. R. Ellison (Eds), Eurachem/EUROLAB/CITAC/Nordtest/AMC Guide: Measurement uncertainty arising from sampling: a guide to methods and approaches, Eurachem, 2007 ([www.eurachem.org](http://www.eurachem.org))
- Measurement uncertainty revisited: Alternative approaches to uncertainty evaluation, Technical report No. 1/2007, EUROLAB, 2007 ([www.eurolab.org](http://www.eurolab.org))
- Guide to the evaluation of measurement uncertainty for quantitative tests results, Technical report No. 1/2006, EUROLAB, 2006 ([www.eurolab.org](http://www.eurolab.org))
- K. Jewell, Microbiological measurement uncertainty: A practical guide, CCFRA, 2004, ISBN 0 905942 66 3 ([www.campdenbri.co.uk](http://www.campdenbri.co.uk))
- EA-4/16, EA guidelines on the expression of uncertainty in quantitative testing, 2003 ([www.european-accreditation.org](http://www.european-accreditation.org))
- V. Barwick, E. Prichard, Introducing measurement uncertainty, LGC, 2003, ISBN 0 948926 21 X ([www.lgcgroup.com/nmi](http://www.lgcgroup.com/nmi))
- ILAC-G17:2002, Introducing the concept of uncertainty of measurement in testing in association with the application of the standard ISO/IEC 17025 ([www.ilac.org](http://www.ilac.org))
- Measurement uncertainty in testing, Technical report No. 1/2002, EUROLAB, 2002 ([www.eurolab.org](http://www.eurolab.org))
- EA-4/02 M, Expression of the uncertainty of measurement in calibration, 2013 ([www.european-accreditation.org](http://www.european-accreditation.org))

### **Articles and reports**

- A. C. Olivieri, N. M. Faber, J. Ferré, R. Boqué, J. H. Kalivas, H. Mark, Uncertainty estimation and figures of merit for multivariate calibration, IUPAC Technical Report, Pure Appl. Chem., 2006, 78(3), 633-661 ([www.iupac.org](http://www.iupac.org))
- J. Kragten, Calculating standard deviations and confidence intervals with a universally applicable spreadsheet technique, Analyst, 1994, 119, 2161-2166 ([www.rsc.org](http://www.rsc.org))
- Eurolab cookbooks (<http://www.eurolab.org/cookbooks.aspx>)
  - Doc No. 8.0, Determination of conformance with specifications or limit values with particular reference to measurement uncertainties – possible strategies, 2008
- Eurachem information leaflets
  - Use of uncertainty information in compliance assessment (2009, updated 2010) ([www.eurachem.org](http://www.eurachem.org))

- Important information to our customers concerning the quality of measurements (2000) ([www.eurachem.org](http://www.eurachem.org))
- AMC Technical Briefs, RSC, (<http://www.rsc.org/Membership/Networking/InterestGroups/Analytical/AMC/TechnicalBriefs.asp>):
  - AMC TB 71-2015, Sampling theory and sampling uncertainty
  - AMC TB 64-2014 Unbalanced robust ANOVA for the estimation of measurement uncertainty at reduced cost
  - AMC TB 58-2014, Estimating sampling uncertainty – how many duplicate samples are needed?
  - AMC TB 53-2012, Dark uncertainty
  - AMC TB 42-2009, The importance, for regulation, of uncertainty from sampling
  - AMC TB 40-2009, The duplicate method for the estimation of measurement uncertainty arising from sampling
  - AMC TB 32-2008, Optimising your uncertainty - a case study
  - AMC TB 26A-2008, Measurement uncertainty and confidence intervals near natural limits
  - AMC TB 22-2006, Uncertainties in concentrations estimated from calibration experiments
  - AMC TB 21A-2008, The estimation and use of recovery factors
  - AMC TB 20-2005, Analytical and sampling strategy, fitness for purpose, and computer games
  - AMC TB 16A-2004, What is uncertainty from sampling, and why is it important?
  - AMC TB 15-2003, Is my uncertainty estimate realistic?



## Statistics

### Web resources

- NIST/SEMATECH e-Handbook of Statistical Methods ([www.itl.nist.gov/div898/handbook/](http://www.itl.nist.gov/div898/handbook/))
- StatSoft Electronic Statistics Textbook ([www.statsoft.com/textbook/](http://www.statsoft.com/textbook/))

### Standards

- ISO 3534-1:2006. Statistics -- Vocabulary and symbols -- Part 1: General statistical terms and terms used in probability ([www.iso.org](http://www.iso.org))
- ISO 3534-2:2006. Statistics -- Vocabulary and symbols -- Part 2: Applied statistics ([www.iso.org](http://www.iso.org))
- ISO 3534-3:2013. Statistics -- Vocabulary and symbols -- Part 3: Design of experiments ([www.iso.org](http://www.iso.org))

### Books

- J. V. Stone, Bayes' Rule: A Tutorial Introduction to Bayesian Analysis, Sebtel Press, 2013, ISBN 0956372848
- D. C. Montgomery, E. A. Peck, G. G. Vining, Introduction to linear regression analysis, 5<sup>th</sup> edition, Wiley, 2012, ISBN 978-0-470-54281-1
- D. P. Kroese, T. Taimre, Z. I. Botev, Handbook of Monte Carlo methods, Wiley, 2011, ISBN 978-0-470-17793-8
- M. Thompson and P. J. Lowthian, Notes on statistics and data quality for analytical chemists, Imperial College Press, 2011, ISBN 978-1848166172
- J. N. Miller, J. C. Miller, Statistics and chemometrics for analytical chemistry, 6<sup>th</sup> Edition, Prentice Hall, 2010, ISBN 0273730428
- S. L. R. Ellison, V. J. Barwick, T. J. Duguid Farrant, Practical statistics for the analytical scientist: A bench guide, 2<sup>nd</sup> Edition, RSC, 2009, ISBN 978 0 85404 131 2
- D. B. Hibbert, J. J. Gooding, Data Analysis for Chemistry: An Introductory Guide for Students and Laboratory Scientists, Oxford University Press, 2005, ISBN, 978-0195162110
- E. Mullins, Statistics for the quality control chemistry laboratory, RSC, 2003, ISBN 978 0 85404 671 3
- I.T. Jolliffe, Principal Component Analysis, 2<sup>nd</sup> edition, Springer, 2002, ISBN: 0387954422
- J. D. Jobson, Applied multivariate data analysis – Volume I: Regression and experimental design (Springer Text in Statistics), Springer, corrected edition 1999, ISBN 9780387976600
- W. P. Gardiner, Statistical analysis methods for chemists: A software based approach, RSC, 1997, ISBN 978 0 85404 549 5
- J. D. Jobson, Applied multivariate data analysis: Volume II: Categorical and multivariate methods (Springer Texts in Statistics), Springer, 1992, ISBN 9780387978048

### Articles and reports

- J. Kragten, Calculating standard deviations and confidence intervals with a universally applicable spreadsheet technique, Analyst, 1994, 119, 2161-2165 ([www.rsc.org](http://www.rsc.org))
- Series "Statistics in Context", VAM Bulletin ([www.lgcgroup.com/nmi](http://www.lgcgroup.com/nmi)):
  - Issue 18, pp18-21: Regression and calibration

- Issue 19, pp 22-27: Missing values, outliers, robust statistics and non-parametric methods
- Issue 20, pp 28-31: Analysis of Variance (ANOVA)
- Issue 21, pp 28-32: Measurement uncertainty and cause and effect analysis
- AMC Technical Briefs, RSC, ([www.rsc.org/Membership/Networking/InterestGroups/Analytical/AMC/TechnicalBriefs.asp](http://www.rsc.org/Membership/Networking/InterestGroups/Analytical/AMC/TechnicalBriefs.asp)):
  - AMC TB 72-2016, AMC Datasets – a resource for analytical scientists
  - AMC TB 69-2015, Using the Grubbs and Cochran tests to identify outliers
  - AMC TB 57-2013, An introduction to non-parametric statistics
  - AMC TB 55-2013, Experimental design and optimisation (4): Plackett-Burman designs
  - AMC TB 52-2013, Bayesian statistics in action
  - AMC TB 50-2012, Robust regression: An introduction
  - AMC TB 39-2009, Rogues and suspects: How to tackle outliers
  - AMC TB 38-2009, Significance, importance and power
  - AMC TB 37-2009, Standard additions: myth and reality
  - AMC TB 36-2009, experimental design and optimisation (3): some fractional factorial designs
  - AMC TB 30-2008, The standard deviation of the sum of several variables
  - AMC TB 27-2007, Why are we weighting?
  - AMC TB 26-2006, Experimental design and optimisation (2): Handling uncontrolled factors
  - AMC TB 24-2006, Experimental design and optimisation (1): An introduction to some basic concepts
  - AMC TB 23-2006, Mixture models for describing multimodal data
  - AMC TB 14-2003, A glimpse into Bayesian statistics
  - AMC TB 10-2002, Fitting a linear functional relationship to data with error on both variables
  - AMC TB 08-2001, The Bootstrap: A Simple Approach to Estimating Standard Errors and Confidence – Intervals when Theory Fails
  - AMC TB 06-2001, Robust statistics: a method of coping with outliers
  - AMC TB 04-2001 (revised March 2006), Representing data distributions with kernel density estimates

## Validation of analytical methods

### Standards

- ASTM E691–16. Standard practice for conducting an interlaboratory study to determine the precision of a test method. ASTM International ([www.astm.org](http://www.astm.org))
- ASTM E1169 – 14. Standard practice for conducting ruggedness tests. ASTM International ([www.astm.org](http://www.astm.org))
- ISO 5725-1:1994. Accuracy (trueness and precision) of measurement methods and results -- Part 1: General principles and definitions (and Corrigendum 1:1998) ([www.iso.org](http://www.iso.org))
- ISO 5725-2:1994. Accuracy (trueness and precision) of measurement methods and results -- Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method (and Technical Corrigendum 1:2002) ([www.iso.org](http://www.iso.org))
- ISO 5725-3:1994. Accuracy (trueness and precision) of measurement methods and results -- Part 3: Intermediate measures of the precision of a standard measurement method (and Corrigendum 1:2001) ([www.iso.org](http://www.iso.org))
- ISO 5725-4:1994. Accuracy (trueness and precision) of measurement methods and results -- Part 4: Basic methods for the determination of the trueness of a standard measurement method ([www.iso.org](http://www.iso.org))
- ISO 5725-5:1998. Accuracy (trueness and precision) of measurement methods and results -- Part 5: Alternative methods for the determination of the precision of a standard measurement method (and Corrigendum 1: 2005) ([www.iso.org](http://www.iso.org))
- ISO 5725-6:1994. Accuracy (trueness and precision) of measurement methods and results -- Part 6: Use in practice of accuracy values (and Corrigendum 1: 2001) ([www.iso.org](http://www.iso.org))
- ISO 11843-1:1997. Capability of detection -- Part 1: Terms and definitions (and Technical Corrigendum 1: 2003) ([www.iso.org](http://www.iso.org))
- ISO 11843-2 2000. Capability of detection -- Part 2: Methodology in the linear calibration case (and Technical Corrigendum 1:2007) ([www.iso.org](http://www.iso.org))
- ISO 11843-5:2008. Capability of detection -- Part 5: Methodology in the linear and non-linear calibration cases ([www.iso.org](http://www.iso.org))
- ISO/TR 13843:2000. Water quality — Guidance on validation of microbiological methods ([www.iso.org](http://www.iso.org))
- ISO/TR 22971:2005. Accuracy (trueness and precision) of measurement methods and results -- Practical guidance for the use of ISO 5725-2:1994 in designing, implementing and statistically analysing interlaboratory repeatability and reproducibility results ([www.iso.org](http://www.iso.org))

### Guides

- Guide to Method Validation for Quantitative Analysis in Chemical Laboratories, PS15, issue 4 February 2016, Irish National Accreditation Board ([www.inab.ie](http://www.inab.ie))
- Guidance document on analytical quality control and method validation procedures for pesticides residues analysis in food and feed, SANTE/11945/2015 ([http://ec.europa.eu/food/plant/docs/plant\\_pesticides\\_mrl\\_guidelines\\_wrkdoc\\_11945\\_en.pdf](http://ec.europa.eu/food/plant/docs/plant_pesticides_mrl_guidelines_wrkdoc_11945_en.pdf))
- B. Magnusson, U. Örnemark (Eds), The fitness for purpose of analytical methods. A laboratory guide to method validation and related topics, 2nd Edition, Eurachem, 2014, (ISBN 978-91-87461-59-0) ([www.eurachem.org](http://www.eurachem.org))
- Guidelines for validation of qualitative binary chemistry methods, AOAC International Stakeholder Panel on Alternative Methods, Approved March 14, 2013 ([www.aoac.org](http://www.aoac.org))

- Guidelines for the validation and verification of quantitative and qualitative test methods, Technical Note 17, NATA, 2013 ([www.nata.com.au](http://www.nata.com.au))
- Protocols for Determination of Limits of Detection and Limits of Quantitation; Approved Guideline Second Edition (EP17-A2), CLSI, 2012 ([www.clsi.org](http://www.clsi.org))
- N. Majcen, P. Taylor, T. Martišius, A. Menditto, M. Patriarca, Practical examples on traceability, measurement uncertainty and validation in chemistry Vol 2, 2011, European Commission, Joint Research Centre (<https://bookshop.europa.eu/en/home/>)
- N. Majcen, P. Taylor, L. Benedik, Practical examples on traceability, measurement uncertainty and validation in chemistry Vol 1, 2010, European Commission, Joint Research Centre (<https://bookshop.europa.eu/en/home/>)
- Guidelines for the implementation of decision 2002/657/EC, SANCO/2004/2726-rev 4-December 2008 ([http://ec.europa.eu/food/safety/docs/cs\\_vet-med-residues\\_cons\\_2004-2726rev4\\_en.pdf](http://ec.europa.eu/food/safety/docs/cs_vet-med-residues_cons_2004-2726rev4_en.pdf))
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