1. Record Nr. UNINA9910271004103321

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Titolo	Analytical Instrumentation [[electronic resource]] : Performance Characteristics and Quality
Pubbl/distr/stampa	Chichester, : Wiley, 2000
ISBN	0470511281 1-282-34577-X 9786612345777 0-470-51129-X
Descrizione fisica	1 online resource (338 p.)
Collana	Analytical Techniques in the Sciences
Disciplina	543 543.07
Soggetti	Chemical process control Chemistry, Analytic Instrumental analysis Measuring instruments Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di contenuto	ANALYTICAL INSTRUMENTATION PERFORMANCE CHARACTERISTICS AND QUALITY; Contents; Series Preface; Preface; Acronyms, Abbreviations and Symbols; About the Author; 1 Analytical Measurements; 1.1 Analytical Procedures; 1.1.1 Calibration; 1.2 Analytical Instrument; 1.3 Data Output; 1.4 Error, Uncertainty and Reliability; 1.4.1 Types of Error; 1.4.2 Precision, Repeatability and Reproducibility; 1.5 Analytical Method Characteristics; 1.5.1 Method Precision; 1.5.2 Ruggedness; 1.5.3 Selectivity (and Specijicity); References; 2 Uncertainty and Random Error; 2.1 Introduction 2.2 Probability Distribution of Errors2.2.1 Normal Distribution; 2.2.2 Rectangular Distribution; 2.3 Expression of Uncertainty; 2.4 Propagation of Errors - Combined Uncertainty; 2.4.1 Addition and Subtraction; 2.4.2 Multiplication and Diviswn; 2.4.3 Powers; 2.4.4 Functions; References; 3 Instrument Performance Characteristics; 3.1 Types of Characteristics; 3.1.1 Experimental Conditions - Types I and I

(u); 3.1.2 Instrument Response - Types II and II(u); 3.2 Generic Response Characteristics; 3.2.1 Responsivity; 3.2.2 Noise; 3.2.3 Offset and Drift; 3.2.4 Linearity and Linear Dynamic Range
3.2.5 Instrument Selectivity (Specificity)3.3 Detectability Characteristics; 3.4 Interaction between Characteristics; 3.5 Memory Effects; 3.6 Specifications; Reference; 4 Quality Systems in Analytical Measurements; 4.1 Introduction; 4.2 Why is a Quality System Needed?; 4.2.1 Collaborative Trials; 4.3 What is a Quality System?; 4.4 Benefits of a Quality System; 4.5 Top-Down and Bottom-Up; 4.6 Approaches to Quality; 4.7 Quality Standards and Accreditation; 4.8 Valid Analytical Measurement (VAM) Programme; 4.9 Proficiency Testing and Certified Reference Materials; 4.10 Validated Methods
4.11 System Suitability Testing4.12 Equipment Qualification; 4.13 Quality Control of Instrument Performance; References; 5 UV-Visible Spectrophotometer Systems; 5.1 Basic (Single-Beam) System; 5.2 Operation of a Single-Beam Instrument; 5.2.1 Without Microprocessor Memory; 5.2.2 With Microprocessor Memory; 5.3 Double-Beam Systems; 5.4 Wavelength Scanning; 5.5 System Performance; 5.6 Spectral Characteristics; 5.6.1 Wavelength Accuracy and Precision; 5.6.2 Spectral Bandwidth; 5.6.3 Stray Light; 5.7 Photometric Uncertainties in Absorbance and Transmittance
5.7.1 Tracing Uncertainties in Absorbance and Transmittance5.7.2 Drzft in Source Output; 5.7.3 Thermal (Johnson) Noise in the Detection System; 5.7.4 Shot Noise in the Detection System; 5.7.5 Combined Photometric Uncertainties; 5.8 Photometric Characteristics; 5.8.1 Accuracy, Precision and Noise; 5.8.2 Baseline Flatness and Baseline Stability (Drifi); 5.8.3 Photometric Linearity; 5.8.4 Operational Wavelength Range; 6 Atomic Spectroscopy; 6.1 Radiation Processes; 6.2 Absorption Spectroscopy; 6.2.1 Flame Atomization; 6.2.2 Graphite Furnace Atomization
6.3 Background Correction for Absorption Systems

Sommario/riassunto

There is an increasing need for analysts to understand and be able to quantify the performance of analytical instruments, in particular with respect to the following:* specifying equipment for purchase* estimating uncertainties in instrumental measurements* quantifying and demonstrating performance qualityThis text links together an understanding of performance characteristics with an appreciation of the limitations imposed by instrument design, leading to the interplay of the validation and qualification processes within quality assurance systems.A unique framework of topi