

1. Record Nr.	UNISA996205526903316
Titolo	Analytical techniques for atmospheric measurement [[electronic resource] /] / edited by Dwayne E. Heard
Pubbl/distr/stampa	Ames, Iowa, : Blackwell Pub., c2006
ISBN	1-280-74804-4 9786610748044 0-470-98851-7 1-4051-7144-8
Descrizione fisica	1 online resource (534 p.)
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Disciplina	551.511028 551.5110287
Soggetti	Atmosphere - Measurement Meteorological instruments Weather forecasting
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Analytical Techniques for Atmospheric Measurement; Contents; Preface; Acknowledgements; Contributors; 1 Field Measurements of Atmospheric Composition; 1.1 The role of field measurements in atmospheric science; 1.1.1 Our changing atmosphere; 1.1.2 The importance of atmospheric chemistry; 1.1.3 Why field measurements of atmospheric composition are important; 1.1.4 The challenges of field measurements in the atmosphere; 1.1.5 Comparison with calculations from numerical models; 1.2 Scope, structure and content of this book; 1.2.1 Scope and structure of the book 1.2.2 Previous texts describing methods for determining atmospheric composition 1.2.3 Content of the book: Summary of individual chapters; 1.3 The measurement of atmospheric composition; 1.3.1 Units of concentration; 1.3.2 Selection criteria for instruments; 1.3.3 Instruments organised by classification of trace species; 1.3.4 Instruments organised by analytical technique; 1.4 Instrument platforms; 1.4.1 Ground-based platforms, including vehicle-based mobile laboratories; 1.4.2 Ship-borne platforms; 1.4.3 Balloon-borne

platforms; 1.4.4 Aircraft-borne platforms
1.4.5 Commercial passenger or freight aircraft platforms
1.4.6 Uninhabited aerial vehicles; 1.4.7 Rocket platforms; 1.4.8 Satellites and other space-borne platforms; 1.5 Analytical methods not covered elsewhere in this book; 1.5.1 LIDAR methods; 1.5.2 Matrix isolation electron spin resonance (MIESR); 1.5.3 Solid-state and electrochemical sensors; 1.5.4 Far-infrared and microwave absorption and emission spectroscopy; 1.5.5 Measurement of fluxes of trace gases and aerosols; 1.6 Quality assurance and quality control; 1.6.1 Precision and accuracy; 1.6.2 Calibration of instruments
1.6.3 Intercomparison of instruments
1.7 Atmospheric chemistry and policy; 1.7.1 Health effects and environmental policy; 1.7.2 Monitoring networks; 1.8 Major field campaigns for measurement of atmospheric composition; 1.8.1 The design of field campaigns; 1.8.2 Case study of a field campaign: The 2002 NAMBLEX campaign; 1.9 Instrumented chambers for the study of simulated atmospheres; 1.10 Future directions; Acknowledgements; Further reading; References; 2 Infrared Absorption Spectroscopy; 2.1 Introduction; 2.2 Fundamentals of infrared absorption spectroscopy
2.2.1 Electromagnetic radiation in the infrared
2.2.2 Molecular interactions in the IR; 2.2.3 Vibrational bands and rotational lines in the IR; 2.2.4 Vibrational bands of atmospheric spectral features in the mid-IR; 2.2.5 Vibrational-rotational spectral line intensities; 2.3 Quantitative trace gas measurements employing IR absorption spectroscopy; 2.3.1 IR absorption lineshapes and linewidths; 2.3.2 Beer-Lambert absorption law and absorbance; 2.4 Trace gases in the atmosphere; 2.5 Measurement approaches employing IR absorption spectroscopy; 2.5.1 In situ measurements; 2.5.2 Remote measurements
2.6 Advances in atmospheric studies employing IR absorption measurements and future directions

Sommario/riassunto

Almost all of the breakthroughs in understanding the atmosphere have been initiated by field observations, using a range of instrumental techniques. Developing or deploying instruments to make further observations demands a thorough understanding of the chemical and spectroscopic principles on which such measurements depend. Written as an authoritative guide to the techniques of instrumental measurement for the atmospheric scientist, research student or undergraduate, *Analytical Techniques for Atmospheric Measurement* focuses on the instruments used to make real time measurements of atmo
