

1. Record Nr.	UNINA9911019337803321
Autore	Vincent James H
Titolo	Aerosol sampling : science, standards, instrumentation and applications // James H. Vincent
Pubbl/distr/stampa	Chichester, England ; ; Hoboken, NJ, : John Wiley & Sons, c2007
ISBN	9786610839117 9781280839115 1280839112 9780470060230 0470060239 9780470060223 0470060220
Descrizione fisica	1 online resource (638 p.)
Disciplina	628.5/30287
Soggetti	Aerosols
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	Aerosol Sampling; Contents; Preface; A SCIENTIFIC FRAMEWORK FOR AEROSOL SAMPLING; 1 Introduction; 1.1 Aerosols; 1.2 Particle size; 1.3 Elementary particle size statistics; 1.4 Aerosol measurement; 1.5 Sampler performance characteristics; References; 2 Fluid and aerosol mechanical background; 2.1 Fluid mechanical background; 2.1.1 Introduction; 2.1.2 Equations of fluid motion; 2.1.3 Streamlines and streamsurfaces; 2.1.4 Boundary layers; 2.1.5 Stagnation; 2.1.6 Potential flow; 2.1.7 Turbulence; 2.2 Aerosol mechanics; 2.2.1 Particle drag force and mobility; 2.2.2 Drag coefficient; 2.2.3 Slip 2.2.4 General equation of motion under the influence of an external force 2.2.5 Particle motion without external forces; 2.2.6 Particle aerodynamic diameter; 2.2.7 Impaction; 2.2.8 Molecular diffusion; 2.2.9 Turbulent diffusion; References; 3 Experimental methods in aerosol sampler studies; 3.1 Introduction; 3.2 Methodology for assessing sampler performance; 3.2.1 The direct (trajectory) method; 3.2.2 The indirect (comparison) method; 3.2.3 Critique of the alternative methods; 3.3 Scaling relationships for aerosol samplers; 3.4

Test facilities; 3.4.1 Moving air; 3.4.2 Calm air  
 3.4.3 Slowly moving air3.5 Test aerosol generation; 3.5.1 Idealised test aerosols; 3.5.2 Dry-dispersed dusts; 3.5.3 Aerosol materials; 3.5.4 Electric charge effects; 3.6 Reference methods; 3.7 Assessment of collected aerosol; 3.8 Aerosol sampler test protocols and procedures; References; 4 The nature of air flow near aerosol samplers; 4.1 Introduction; 4.2 Line and point sink samplers; 4.3 Thin-walled slot and tube entries; 4.3.1 Facing the freestream; 4.3.2 Other orientations; 4.4 Thick-walled tubes; 4.5 Simple blunt samplers facing the wind; 4.5.1 Two-dimensional blunt sampling systems 4.5.2 Axially symmetric blunt sampling systems4.6 Blunt samplers with orientations other than facing the wind; 4.6.1 A cylindrical blunt sampler; 4.6.2 Flow stability; 4.6.3 A spherical blunt sampler; 4.7 More complex sampling systems; 4.8 Effects of freestream turbulence; References; 5 Aerosol aspiration in moving air; 5.1 Introduction; 5.2 Thin-walled tube samplers; 5.2.1 Qualitative picture of aerosol transport; 5.2.2 Impaction model for a thin-walled tube facing the freestream; 5.2.3 Physical definition of impaction efficiency for aerosol sampling 5.2.4 Experimental studies for thin-walled tubes facing the freestream5.2.5 Experimental studies for thin-walled tubes at other orientations; 5.2.6 Impaction model for other orientations; 5.2.7 Mathematical models; 5.2.8 Conditions for 'acceptable' isokinetic sampling; 5.3 Blunt samplers; 5.3.1 Impaction model for a blunt sampler facing the freestream; 5.3.2 Experimental investigations of blunt samplers of simple shape facing the wind; 5.3.3 Blunt samplers at other orientations; 5.3.4 Mathematical and numerical approaches to blunt samplers; 5.3.5 Orientation-averaged conditions; References 6 Aspiration in calm and slowly moving air

## Sommario/riassunto

This book provides a comprehensive account of the important field of aerosol sampling as it is applied to the measurement of aerosols that are ubiquitous in occupational and living environments, both indoor and outdoor. It is written in four parts: Part A contains 9 chapters that describe the current knowledge of the physical science that underpins the process of aerosol sampling. Part B contains 4 chapters, which present the basis of standards for aerosols, including the link with human exposure by inhalation. Part C contains 7 chapters that cover the development of practical aerosol sa