First edition 2011-04-01

Workplace atmospheres — Characterization of ultrafine aerosols/ nanoaerosols — Determination of the size distribution and number concentration using differential electrical mobility analysing systems

Air des lieux de travail — Caractérisation des aérosols ultrafins/ nanoaérosols — Détermination de la distribution granulométrique et de la concentration en nombre à l'aide de systèmes d'analyse différentielle de mobilité électrique



Reference number ISO 28439:2011(E)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2011

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents Page Forewordiv Introduction......v 1 Scope......1 2 3 Terms and definitions1 Symbols and abbreviated terms.....2 4.1 Abbreviated terms3 4.2 5 Principle3 Equipment4 6 General4 6.1 6.2 Sampling line4 6.3 Pre-separator5 6.4 Particle charge conditioner5 6.5 DEMC5 6.6 Aerosol particle detector5 7 Measurement strategy6 8 Measuring procedure 6 Preparation.......6 8.1 8.2 Sampling7 9 Presentation and evaluation of data......7 Check of DMAS performance.....8 10 10.1 Check on particle classification......8 10.2 Check on particle number-counting efficiency.....8 11 Problems and errors8 11.1 CPC (CNC) counting efficiency.....8 11.2 Particles with multiple charges......9 11.3 Sampling losses9 11.4 11.5 Overloading......11 11.6 Sampling of fibres11 11.7 Humidity11 11.8 Maintenance......11 Bibliography......14

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 28439 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 137, Assessment of workplace exposure to chemical and biological agents, in collaboration with Technical Committee ISO/TC 146, Air quality, Subcommittee SC 2, Workplace atmospheres, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Introduction

Within occupational hygiene, aerosol concentrations have been traditionally measured in terms of mass concentrations. For some ultrafine aerosols and nanoaerosols, other exposure metrics such as the number and surface area concentration are likely to become important for predicting health effects, depending on chemical and physical properties. This International Standard provides a method for determining the number concentration and size distribution of ultrafine aerosols and nanoaerosols at workplaces by using differential mobility analysing systems (DMASs). This can be used by occupational hygienists and researchers to measure the concentration at some workplaces. The system is generally not suitable for personal exposure measurements.