Australian/New Zealand Standard™

Methods for sampling and analysis of ambient air

Method 9.11: Determination of suspended particulate matter—PM_{10} beta attenuation monitors

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EV-007, Methods for Examination of Air, to supersede AS/NZS 3580.9.11:2008.

The objective of this Standard is to provide regulatory and testing bodies with a method for continuously monitoring suspended particulate matter with an equivalent aerodynamic diameter (EAD) of less than 10 µm in ambient air, providing near real-time measurement of mean particle concentration. This is one in a series of Standards for the determination of particulate matter in ambient air.

During the preparation of this Standard, the Committee again paid attention to ISO 10473:2000, *Ambient air—Measurement of the mass of particulate matter on a filter medium—Beta-ray absorption method*, but this was not adopted as some commonly used instruments fall outside its scope.

The requirements for instruments specified in this Standard were derived from those given in the United States Environmental Protection Agency (US EPA) *Code of Federal Regulations*, Title 40 Protection of Environment, Part 53 'Ambient air monitoring reference and equivalent methods', (40 CFR 53) Subpart B, 'Procedures for Testing Performance Characteristics of Automated Methods for SO_2, CO, O_3, and NO_2'.

Instruments bearing the US EPA equivalency designation predominate in Australia and New Zealand. Accordingly, it was deemed appropriate to accept the US EPA designation of instruments with minor modifications for local requirements where necessary. The US EPA definitions for performance characteristics vary considerably in presentation (if not in substance) from those currently prescribed in ISO 9169:2006, *Air quality—Definition and determination of performance characteristics of an automatic measuring system*, but have nevertheless been retained, for the sake of preserving consistency with US EPA.

The term 'normative' has been used in this Standard to define the application of the appendix to which it applies. A 'normative' appendix is an integral part of a Standard.

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METHOD

1 SCOPE

This Standard sets out the method for the determination of suspended particulate matter in ambient air using a beta attenuation monitor (BAM). This method can provide a measure of the time-integrated mean particle concentrations for periods ranging from 10 min to 24 h. Measurements made in accordance with this method, when averaged over a 24-hour period, are considered to be equivalent to those determined in accordance with US EPA *Code of Federal Regulations*, Title 40 Protection of Environment, Part 53 'Ambient air monitoring reference and equivalent methods', Subpart D, 'Procedures for Testing Performance Characteristics of Methods for PM_{10}'.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS ISO/IEC 17025	General requirements for the competence of testing and calibration laboratories
AS/NZS 3580	Methods for sampling and analysis of ambient air
3580.1.1	Method 1.1: Guide to siting air monitoring equipment
ISO/IEC Guide 98-3:2008	Uncertainty of measurement—Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)
EN 12341	Ambient air—Standard gravimetric measurement method for the determination of the PM_{10} or $PM_{2,5}$ mass concentration of suspended particulate matter
US EPA 40 CFR 53	Code of Federal Regulations, Title 40 Protection of Environment, Part 53 Ambient Air Monitoring Reference and Equivalent Methods, Subpart D Procedures for Testing Performance Characteristics of Methods for PM_{10}

NEPC
Environment Protection and Heritage Council, Peer Review Committee (PRC)

National Environment Protection (Ambient Air Quality) Measure, Technical Paper No. 5, Data Collection and Handling, 2001

3 DEFINITIONS

For the purposes of this Standard, the definitions below apply.

3.1 Areic

Modifier used to denote an attribute divided by area.

3.2 Beta ray

Radiation emitted by electrons during the nuclear decay of radioactive elements. Monitors used in compliance with this method typically use an element such as Carbon 14 (^{14}C).

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