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## **SOUTH AFRICAN NATIONAL STANDARD**

### **Determination of lead (inorganic and tetra-alkyl) in workplace air by atomic absorption spectrophotometry**

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**Table of changes**

<b>Change No.</b>	<b>Date</b>	<b>Scope</b>
Amdt 1	2009	Amended to change the designation from SABS to SANS, with no technical changes.

**Foreword**

This South African standard was prepared by National Committee SABS/TC 146, *Air quality*, in accordance with procedures of the South African Bureau of Standards, in compliance with annex 3 of the WTO/TBT agreement.

This document was published in April 2009. This document supersedes SABS SM 1164:1990 (first edition).

**This document is referenced in the Occupational Health and Safety Act, 1993 (Act No.85 of 1993).**

**Compliance with this document cannot confer immunity from legal obligations.**

**Reaffirmed and reprinted in January 2018.  
This document will be reviewed every five years  
and be reaffirmed, amended, revised or withdrawn.**

## **Determination of lead (inorganic and tetra-alkyl) in workplace air by atomic absorption spectrophotometry**

### **1 Scope**

This standard specifies a method for the determination of the lead in air samples collected by filters or impingers. The method is applicable to personal sampling as well as static sampling.

### **2 Principle**

**2.1** Filter (cellulose ester membrane) samples are wet-ashed using nitric acid and hydrogen peroxide. The ash is dissolved in dilute nitric acid and diluted to a known volume.

**2.2** Impinger samples are quantitatively transferred to a volumetric flask and diluted to a known volume.

**2.3** The diluted samples are aspirated into an air-acetylene flame of an atomic absorption spectrophotometer and the absorbances measured at 217,0 nm.

NOTE The lead content may also be determined by means of other suitable analytical techniques, which include colorimetry, polarography, anodic stripping voltammetry, atomic absorption spectrophotometry with electrothermal atomization and inductively-coupled plasma (ICP) atomic emission spectrophotometry.

### **3 Personal sampling of lead, inorganic dusts and fumes**

**3.1 Equipment.** A sampling train that includes the components given in 3.1.1-3.1.7 (inclusive).

NOTE Assembly instructions are given in 3.2.3.

**3.1.1 A battery-operated portable pump,** that

a) is capable of delivering, for a period of 8 h, 2 L of air per minute, with a filter in the sampling train;

NOTE The maximum deviation from the prescribed flow rate shall not exceed  $\pm 5\%$ .

b) is intrinsically safe;

c) includes a calibrated flow meter or a mechanism for maintaining a constant flow rate; and

d) has an on-off switch and flow rate control or adjustment mechanism that is tamperproof.