AS 2134.3—1994
Reconfirmed 2016

Australian Standard®

Recommended practice for chemical analysis by atomic absorption spectrometry

Part 3: Vapour generation atomic absorption spectrometry

This Australian Standard was prepared by Committee CH/16, Spectroscopy. It was approved on behalf of the Council of Standards Australia on 11 March 1994 and published on 16 May 1994.

The following interests are represented on Committee CH/16:

Australian Chamber of Commerce and Industry

Bureau of Steel Manufacturers of Australia

CSIRO, Division of Materials Science and Technology

CSIRO, Division of Energy Chemistry

CSIRO, Division of Mineral Chemistry

Department of Defence

Government Chemical Laboratories, Qld

National Association of Testing Authorities

Royal Australian Chemical Institute

Additional interests participating in preparation of Standard:

Broken Hill Associated Smelters

Hendry and Hampson Laboratories

Sulphide Corporation

This Standard was issued in draft form for comment as DR 93118.

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 2134.3—1994

Recommended practice for chemical analysis by atomic absorption spectrometry Part 3: Vapour generation atomic absorption spectrometry

RECONFIRMATION NOTICE

Technical Committee CH-016 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 5 October 2016.

The following are represented on Technical Committee CH-016:

Australian Institute of Physics
Environmental Laboratory Industry Group
National Association of Testing Authorities Australia
National Measurement Institute

NOTES

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PREFACE

This Standard was prepared by the Standards Australia Committee on Spectroscopy, under the direction of the Multitechnics Standards Policy Board, as a part of the AS 2134 series of Standards on atomic absorption spectrometry. Part 1 of the series covers flame atomic absorption spectrometry and Part 2 deals with graphite furnace atomic absorption spectrometry.

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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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard sets out recommendations for instrumentation and operating techniques suitable for chemical analysis by vapour generation atomic absorption spectrometry (VGAAS) and includes a summary of testing procedures and requirements for safe operation. Elements covered in the recommended procedures include mercury and the hydride-forming elements, i.e. antimony, arsenic, bismuth, germanium, lead, selenium, tellurium and tin.

NOTES:

1 Flame atomic absorption spectrometry and graphite furnace atomization techniques are dealt with in AS 2134.1 and AS 2134.2 respectively.

2 This Standard should be read in conjunction with the instrument manufacturer's recommendations.

1.2 PRINCIPLE Vapour generation atomic absorption spectometry relies upon—

(a) separation of the analyte from the matrix either as free atoms, e.g. mercury, or as the hydride formed by the addition of sodium borohydride to an acidic solution of the analyte;

(b) production of free atoms of the element;

(c) free atoms being able to absorb energy only at certain discrete wavelengths, usually resonance wavelengths; and

(d) the energy absorbed being a function of the concentration of the absorbing atoms.

NOTE: Ionic mercury may be readily converted to free atomic vapour by reduction. Mercury is transported to an optical cell or tube maintained at room temperature for atomic absorption measurement. The other elements listed in Clause 1.1 form hydrides which are volatile at room temperature. Volatile hydrides are transported to an atomizer where free atoms of the analyte are formed.

1.3 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS	
2134	Recommended practice for chemical analysis by atomic absorption spectrometry
2134.1	Part 1: Flame atomic absorption spectrometry
2134.2	Part 2: Graphite furnace spectrometry
2135	Glossary of terms used in flame atomic absorption spectroscopy
2243	Safety in laboratories
2243.6	Part 6: Mechanical aspects