

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.

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OF

AS 2134.3—1994

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

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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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CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE	4
1.2 PRINCIPLE	4
1.3 REFERENCED DOCUMENTS	4
1.4 DEFINITIONS	5
SECTION 2 INSTRUMENTATION	
2.1 GENERAL	5
2.2 SOURCES OF RADIATION	6
2.3 VAPOUR GENERATION SYSTEM	6
2.4 ATOMIZATION SYSTEM	7
2.5 SAFETY PRECAUTIONS	8
2.6 MONOCHROMATOR	8
2.7 MEASUREMENT SYSTEM	9
SECTION 3 SYSTEM OPERATION	
3.1 GENERAL	10
3.2 FACTORS AFFECTING VAPOUR GENERATION	10
3.3 FACTORS AFFECTING VAPOUR TRANSPORT	11
3.4 FACTORS AFFECTING ATOMIZATION AND MEASUREMENT	11
3.5 ELEMENT OPTIMIZATION	12
3.6 SENSITIVITY	13
3.7 PRECISION	13
3.8 SETTING-UP PROCEDURE	14
SECTION 4 CALIBRATION AND ANALYSIS	
4.1 CONTAMINATION AND REAGENT PURITY	15
4.2 CONTAINERS	15
4.3 REFERENCE MATERIALS	15
4.4 CALIBRATION AND TEST SOLUTIONS	15
4.5 CALIBRATION GRAPH	16
4.6 CALIBRATION AND TEST PROCEDURE	17
4.7 ACCEPTANCE OF RESULTS	21
APPENDIX A FLOW SHEET ON THE PROCEDURE FOR THE ACCEPTANCE OF ANALYTICAL VALUES FOR TEST SAMPLES	23

STANDARDS AUSTRALIA

Australian Standard

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atomic absorption spectrometric

Part 3: Vapour generation atomic absorption spectrometry

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 spectrometry 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