

Australian Standard™

**Recommended practice for chemical
analysis by atomic absorption
spectrometry**

Part 2: Graphite furnace spectrometry

This Australian Standard was prepared by Committee CH/16, Spectroscopy. It was approved on behalf of the Council of Standards Australia on 29 October 1999 and published on 5 December 1999.

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OF

AS 2134.2—1999

**Recommended practice for chemical analysis by atomic absorption spectrometry
Part 2: Graphite furnace spectrometry**

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NOTES

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PREFACE

This Standard was prepared by the Standards Australia Committee CH/16, Spectroscopy, to supersede AS 2134.2—1989.

This Standard will be Part 2 of a series comprising:

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 atomic absorption spectrometry
- 2134.3 Part 3: Vapour generation atomic absorption spectrometry

The objective of this Standard is to set out recommended practices for the operation of graphite furnace spectrometers used in chemical analysis. The Standard includes a description of instrumentation, optimization procedures, calibration, test procedures and information on factors affecting atomic absorption. A section on analytical quality assurance has been added to the Standard.

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STANDARDS AUSTRALIA

Australian Standard

Recommended practice for chemical analysis by atomic absorption spectrometry

Part 2: Graphite furnace spectrometry

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard sets out recommendations for instrumentation and operating techniques suitable for chemical analysis by graphite furnace atomic absorption spectrometry (GFAAS) and includes a summary of testing procedures and requirements for safe operation. While this Standard is written primarily for a graphite furnace, the principles are applicable to alternative types of electrothermal atomization; and while written substantially for liquid sample introduction, the principles discussed are of application to solid sample introduction.

NOTES:

- 1 Flame atomization and vapour generation techniques are dealt with in Parts 1 and 3 of the AS 2134 series of Standards.
- 2 This Standard should be read in conjunction with the instrument manufacturer's recommendations.
- 3 A flowsheet on the procedure for the acceptance of analytical values for test sample is shown in Appendix A.

1.2 PRINCIPLE GFAAS relies upon—

- (a) heating a sample sufficiently to produce free atoms;
- (b) free atoms of an element being able to absorb energy only at certain discrete wavelengths (usually resonance wavelengths: refer to Appendix B; and
- (c) the energy absorbed being a function of the concentration of the absorbing atoms.

The technique described in this Standard involves the introduction of a sample, usually a solution of the sample, into a graphite furnace, heating of the furnace by an electric current and measurement of the absorption of energy at a specified wavelength.

1.3 REFERENCED DOCUMENTS The documents below 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

2134.3 Part 3: Vapour generation atomic absorption spectrometry

2162 Verification and use of volumetric apparatus

2162.1 Part 1: General—Volumetric glassware

2250 Chemical analysis—Interlaboratory test programs—For determining precision of analytical method(s)—Guide to the planning and conduct

2929 Test methods—Guide to the format, style and content

BS

5703 Guide to data analysis and quality control using cusum techniques (series)

1.4 DEFINITIONS For the purpose of this Standard the definitions in Appendix B apply