AS 2134.2—1999
Reconfirmed 2016

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.

The following interests are represented on Committee CH/16:

Australian Chamber of Commerce and Industry

CSIRO Energy Technology

CSIRO Manufacturing Science and Technology

Department of Defence (Australia)

Department of Natural Resources Qld.

National Association of Testing Authorities, Australia

Queensland Health Scientific Services

This Standard was issued in draft form for comment as DR 98649.

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 2134.2—1999

Recommended practice for chemical analysis by atomic absorption spectrometry
Part 2: Graphite furnace 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 05 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

Australian Standard™

Recommended practice for chemical analysis by atomic absorption spectrometry

Part 2: Graphite furnace spectrometry

Originated as AS 2134.2—1989.
Second edition 1999.

Published by Standards Australia International Ltd
PO Box 1055, Strathfield, NSW 2135, Australia

ISBN 0 7337 3062 0

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.

CONTENTS

Page

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
2850 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