AS 2134.2—1989

Australian Standard®

Recommended practice for chemical analysis by atomic absorption spectrometry

Part 2: Graphite furnace spectrometry

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STANDARDS AUSTRALIA

This Australian Standard was prepared by Committee CH/16, Spectroscopy. It was approved on behalf of the Council of Standards Australia on 31 March 1989 and published on 13 October 1989.

The following interests are represented on Committee CH/16:

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

CSIRO, Division of Energy Chemistry

CSIRO, Division of Materials Science and Technology

CSIRO, Division of Mineral Chemistry

Department of Defence

Government Chemical Laboratory, Qld

National Association of Testing Authorities, Australia

Royal Australian Chemical Institute

Additional interests participating in preparation of Standard:

Lead and zinc producers

Private pathology laboratories

This Standard was issued in draft form for comment as DR 88089.

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First published as AS 2134.2—1989.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
STANDARDS HOUSE, 80 ARTHUR ST, NORTH SYDNEY NSW
ISBN 0 7262 5698 6

PREFACE

This Standard was prepared by the Standards Australia Committee on Spectroscopy under the direction of the Chemical Standards Board as an additional part of the AS 2134 series of Standards on atomic absorption spectrometry. Part 1 covers flame atomic absorption spectrometry while a further part, not yet published, will deal with vapour generation atomic absorption spectrometry.

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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 graphite furnace atomic absorption spectrometry (AAS) and includes a summary of testing procedures and requirements for safe operation. While this Standard is written primarily for 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 other parts of the AS 2134 series of Standards.
2. This Standard should be read in conjunction with the instrument manufacturer's recommendations.

1.2 PRINCIPLE. Graphite furnace AAS 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 Clause 1.4); 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

2135 Glossary of terms used in flame atomic absorption spectroscopy

2850 Chemical analysis—Interlaboratory test programs—For determining precision of analytical method(s)—Guide to the planning and conduct

1.4 DEFINITIONS. For the purpose of this Standard the definitions in AS 2135 and the following apply.

1.4.1 Resonance wavelength—a wavelength corresponding to the transfer of an electron between the ground state and a higher energy level in a specified atom.