AS 2134.1—1988

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2134.1—1988

RECOMMENDED PRACTICE FOR CHEMICAL ANALYSIS BY ATOMIC ABSORPTION SPECTROMETRY

Part 1—FLAME ATOMIC ABSORPTION SPECTROMETRY

This Australian Standard was prepared by Committee CH/16, Spectroscopy. It was approved on behalf of the Council of the Standards Association of Australia on 15 May 1988 and published on 15 July 1988.

The following interests are represented on Committee CH/16:

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

CSIRO, Division of Materials Science and Technology

CSIRO, Division of Energy Chemistry

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Sulphide Corporation

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AUSTRALIAN STANDARD

RECOMMENDED PRACTICE FOR CHEMICAL ANALYSIS BY ATOMIC ABSORPTION SPECTROMETRY

Part 1
FLAME ATOMIC ABSORPTION SPECTROMETRY

AS 2134.1—1988

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PREFACE

This Standard was prepared by the Association's Committee on Spectroscopy under the direction of the Chemical Standards Board to supersede AS 2134—1978, *Code of practice for the chemical analysis of materials by flame atomic absorption spectroscopy*. It is Part 1 of a three part series on atomic absorption spectrometry. Part 2 of the series will cover graphite furnace atomic absorption spectrometry while Part 3 will cover vapour generation atomic absorption spectrometry. This Standard describes flame atomic absorption spectrometric instruments and their use in methods of analysis. The recommendations herein are intended to apply to Australian Standard methods for atomic absorption spectrometric analysis.

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PART 1: FLAME 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 flame atomic absorption spectrometry (AAS) and includes a summary of testing procedures and requirements for safe operation.

NOTES:

1. Graphite furnace 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. Flame 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 1.4.1); and

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

The technique described in this Standard involves nebulizing a solution of the sample into a flame and measuring the absorption of energy at a specified wavelength. The apparatus is so designed that the absorption measurement is independent of any radiation emitted by the flame.

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

AS

1674 Fire precautions in cutting, heating and welding operations

1940 SAA Flammable and Combustible Liquids Code

2135 Glossary of terms used in flame atomic absorption spectroscopy

2508 Safe storage and handling information for hazardous materials

Card 2.01: Acetylene (dissolved) (AS 2508.2.001)

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 that below 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.