

Australian Standard™

**Recommended practice for atomic
emission spectrometric analysis**

Part 1: Principles and techniques

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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Australian Chamber of Commerce and Industry
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RECONFIRMATION

OF

AS 3641.1—1999

**Recommended practice for atomic emission spectrometric analysis
Part 1: Principles and techniques**

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NOTES

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Part 1: Principles and techniques

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PREFACE

This Standard was prepared by the Standards Australia Committee CH/16, Spectroscopy to supersede AS 3641.1—1989.

The objective of this Standard is to describe recommended procedures, principles and techniques involved in the setting up and operation of arc/spark discharge atomic emission spectrometers and inductively coupled plasma instruments for use in chemical methods of analysis. A section on analytical quality assurance has been added to the Standard. The recommendations in this Standard are intended to apply to Australian Standard methods for atomic emission spectrometric analysis.

This Standard is part of a series as follows:

AS

3641 Recommended practice for atomic emission spectrometric analysis

3641.1 Part 1: Principles and techniques

3641.2 Part 2: Inductively coupled plasma excitation

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STANDARDS AUSTRALIA

Australian Standard

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Part 1: Principles and techniques

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard sets out recommendations for instrumentation and operating procedures in the application of atomic emission spectrometry to chemical analysis.

NOTE: This Standard should be read in conjunction with the instrument manufacturer's recommendations.

1.2 PRINCIPLES OF THE ATOMIC EMISSION TECHNIQUE When atoms of elements are excited using a suitable excitation source they emit electromagnetic radiation in the form of a spectrum. The spectrum of each element is determined primarily by the electronic configuration of the atom and, as atoms of different elements have different electronic configurations, each element has a distinct and characteristic spectrum. The characteristic spectrum consists of a number of wavelengths which correspond to the emission of electromagnetic radiation arising from the transition of electrons in various excited states to lower energy states. The intensity of the electromagnetic radiation which is emitted at a characteristic wavelength is proportional to the concentration of the element in the sample.

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

AS

- 1940 The storage and handling of flammable and combustible liquids
- 2162 Verification and use of volumetric apparatus
- 2162.1 Part 1: General—Volumetric glassware
- 2243 Safety in laboratories
- 2243.5 Part 5: Non-ionizing radiations
- 2347 Zinc and zinc alloys—Sampling for chemical and spectrochemical analysis
- 2534 Lead and lead alloys—Sampling for chemical and spectrochemical analysis
- 2612 Aluminium and aluminium alloys—Sampling for chemical and spectrochemical analysis
- 2614 Copper and copper alloys—Sampling for chemical and spectrochemical analysis and physical testing
- 2772 Radiofrequency radiation
- 2772.2 Part 2: Principles and methods of measurement—300 kHz to 100 GHz
- 2850 Chemical analysis—Interlaboratory test programs—For determining precision of analytical method(s)—Guide to the planning and conduct
- 2883 Analysis of metals—Procedures for the setting up, calibration and standardization of atomic emission spectrometers using arc/spark discharge
- 2929 Test methods—Guide to the format, style and content
- 3641 Recommended practice for atomic emission spectrometric analysis
- 3641.2 Part 2: Inductively coupled plasma excitation