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Australian Standard 2134—1978

CHEMICAL ANALYSIS OF MATERIALS BY FLAME ATOMIC ABSORPTION SPECTROSCOPY

STANDARDS ASSOCIATION OF AUSTRALIA
Incorporated by Royal Charter

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THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

Australian Atomic Energy Commission

Australian Mineral Development Laboratories

Bureau of Steel Manufacturers of Australia

CSIRO, Division of Chemical Physics

Department of Defence

National Association of Testing Authorities

Railways of Australia Committee

Royal Australian Chemical Institute

State Electricity Commission of Victoria

Other firms and organizations specializing in this field

This standard, prepared by Committee CH/16, Spectroscopy, was approved on behalf of the Council of the Standards Association of Australia on 18 October 1977, and was published on 1 February 1978.

In order to keep abreast of progress in industry Australian standards are regularly reviewed. Suggestions for improvements to published standards, addressed to the head office of the Association, are welcomed.

This standard was issued in draft form for public review as DR 76080.

AUSTRALIAN STANDARD

CODE OF PRACTICE FOR

THE CHEMICAL ANALYSIS OF MATERIALS BY FLAME ATOMIC ABSORPTION SPECTROSCOPY

AS 2134—1978

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PREFACE

This standard was prepared by the Association's Committee on Spectroscopy as a revision of AS CK18—1970, which it accordingly supersedes. It describes flame atomic absorption spectrometric instruments and their use in methods of analysis. The recommendations are intended to apply to Australian standard methods for atomic absorption analysis when this standard is called up by such methods.

This standard requires reference to the following Australian standards:

AS 1674 SAA Cutting and Welding Safety Code

AS 1940 SAA Flammable and Combustible Liquids Code

AS 2135 Glossary of Terms Used in Flame Atomic Absorption Spectroscopy.

The inclusion of the following paragraph, or a suitable equivalent, in any Australian standard method of analysis constitutes notification that the atomic absorption spectrometric instruments and atomic absorption practice prescribed in that method are subject to the recommendations set down in this standard:

'**Atomic Absorption Spectrometers and Atomic Absorption Practice.** The instruments and practice described in this method conform to AS 2134, Code of Practice for the Chemical Analysis of Materials by Flame Atomic Absorption Spectroscopy.'

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
CODE OF PRACTICE FOR THE CHEMICAL ANALYSIS OF MATERIALS BY ATOMIC ABSORPTION SPECTROSCOPY

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This code sets out recommendations for apparatus and operating techniques in the application of flame atomic absorption spectroscopy in the chemical analysis of materials generally. It includes a summary of testing procedures and requirements for safe operation.

NOTE: The code should be read in conjunction with the instrument manufacturer's recommendations.

1.2 PRINCIPLE. When a sample is heated sufficiently to free the analyte from its chemical bonds, the atoms of the element which are in the ground or unexcited state are able to absorb energy only at certain discrete wavelengths. These are usually resonance wavelengths, and the absorbance is proportional to the concentration of the atoms of the element causing the absorption. Thus, if a light source which emits the atomic spectrum of the analyte is used under conditions causing the production of sharp lines having half-widths of the same order as or less than the corresponding absorption lines, the absorbance by the same element in the atomized sample will be proportional to the concentration of the element in the sample.

The technique usually adopted is to nebulize a solution of the sample into a flame and measure the absorption by the atoms in the flame at a selected resonance wavelength of the required element, the apparatus being so designed that the absorption measurement is independent of any radiation emitted by the flame.

1.3 DEFINITIONS. The terms used in this code shall be interpreted in accordance with AS 2135.*

*AS 2135, Glossary of Terms Used in Flame Atomic Absorption Spectroscopy.