STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 2769—1985
WATERS—DETERMINATION OF MANGANESE—FLAME ATOMIC ABSORPTION SPECTROMETRIC METHOD

RECONFIRMATION NOTICE

Technical Committee EV-008 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 15 September 2017.

The following are represented on Technical Committee EV-008:

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Australian Contaminated Land Consultants Association
Australian Nuclear Science & Technology Organisation
Australian Water Association
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National Association of Testing Authorities Australia
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NOTES

AS 2769—1985
Reconfirmed 2017

Australian Standard®

WATERS—
DETERMINATION OF
MANGANESE—
FLAME ATOMIC ABSORPTION
SPECTROMETRIC METHOD

This Australian standard was prepared by Committee CH/22, Methods for Examination of Waters. It was approved on behalf of the Council of the Standards Association of Australia on 7 November 1984 and published on 4 April 1985.

The following interests are represented on Committee CH/22:

Australian Mining Industry Council
Australian Water Resources Council
Confederation of Australian Industry
CSIRO, Division of Energy Chemistry
Department of Health, N.S.W.
Department of Housing and Construction (Commonwealth)
Department of Home Affairs and Environment
Department of Local Government, Queensland
Department of the Environment, Tasmania
Department of Science (Commonwealth)
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Metropolitan Water Sewerage and Drainage Board, Sydney
National Association of Testing Authorities, Australia
National Health and Medical Research Council
Royal Australian Chemical Institute
Rural Water Commission, Victoria
Water Resources Commission, N.S.W.

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PREFACE

This standard for determining manganese in waters by flame atomic absorption spectrometry was prepared by the Association's Committee on Methods for Examination of Waters.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

for

WATERS—DETERMINATION OF MANGANESE—FLAME ATOMIC ABSORPTION SPECTROMETRIC METHOD

1 SCOPE. This standard sets out a method for the determination of filtrable manganese in waters using flame absorption spectrometry. A procedure for the determination of non-filtrable manganese is set out in Appendix A.

2 APPLICATION. This method is applicable to natural and waste waters having a filtrable manganese concentration in the range 0.005 mg/L to 5.0 mg/L.

Manganese in the range 0.05 mg/L to 5.0 mg/L may be determined by direct aspiration. The range 0.005 mg/L to 0.05 mg/L requires a prior extraction.

NOTE: The lower limit of detection for direct aspiration for saline waters may be higher than that for fresh waters.

3 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 2031 Recommendations for the Selection of Containers and Preservation of Water Samples for Chemical and Microbiological Analysis
Part 1—Chemical

AS 2134 Code of Practice for the Chemical Analysis of Materials by Flame Atomic Absorption Spectroscopy

AS 2162 Code of Practice for the Use of Volumetric Glassware

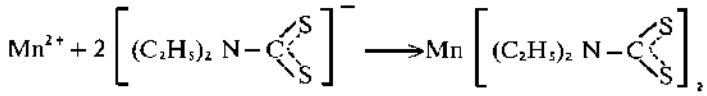
4 PRINCIPLE.

4.1 Direct aspiration. Manganese in the concentration range 0.5 mg/L to 5.0 mg/L is determined by direct aspiration of a sample into an air-acetylene flame of an atomic absorption spectrometer and the absorption measured at 279.5 nm. For saline samples a nitrous oxide-acetylene flame may be used to overcome matrix effects.

4.2 Extraction procedure. To extend the range to 0.005 mg/L it is necessary to concentrate the manganese using a complexing/extraction technique. The complexing/extraction technique may also be used to separate the manganese from the matrix as an alternative to direct aspiration into a nitrous oxide-acetylene flame.

At pH 5 to 6, manganese(II) is chelated by sodium diethyldithiocarbamate (NaDDC). The chelate is extracted into a known volume of diisobutyl ketone (DIBK), then back extracted into dilute acid and this extract is used for the determination of the metal by atomic absorption spectrometry.

5 REACTION. The chelation reaction for the extraction procedure may be represented by the following equation:



6 REAGENTS.

6.1 General. Unless otherwise specified, use only analytical grade reagents and doubly distilled water or water of equivalent purity.

6.2 Solids.

6.2.1 *Sodium sulphate (anhydrous).*

6.3 Solutions.

6.3.1 *Nitric acid* (ϱ_{20} 1420 kg/m^3).

6.3.2 *Nitric acid* (200 mL/L). Add 200 mL of nitric acid (6.3.1) to 800 mL of water.

6.3.3 *Sodium hydroxide* (200 g/L). Cautiously dissolve 200 g of sodium hydroxide in 800 mL of water. Cool and dilute to 1 L.

6.3.4 *Hydrochloric acid* (100 mL/L). Add 100 mL of hydrochloric acid (ϱ_{20} 1160 kg/m^3) to 900 mL of water.