

Australian Standard[®]

**Recommended practice for inductively
coupled plasma mass spectrometry
(ICP-MS)**

**Part 2: Quantitative determination—
Water**



This Australian Standard® was prepared by Committee CH-016, Spectroscopy. It was approved on behalf of the Council of Standards Australia on 9 October 2009. This Standard was published on 4 November 2009.

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- Australian Chamber of Commerce and Industry
- Australian Institute of Physics
- Australian Nuclear Science & Technology Organisation
- Department of Natural Resources and Water, Qld
- Environmental Laboratory Industry Group
- National Association of Testing Authorities Australia
- National Measurement Institute
- Queensland Health Scientific Services
- Royal Australian Chemical Institute

Additional Interests:

- International Precious Metal Institute
 - Murdoch University
 - RMIT University
 - Sydney Water Corporation
 - University of Canberra
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PREFACE

This Standard was prepared by the Standards Australia Committee CH-016, Spectroscopy.

The objective of this Standard is to describe the procedures for the quantitative determinations of elements in water by ICP-MS.

This Standard is part of a series as follows:

AS

4873 Recommended practice for inductively coupled plasma mass spectrometry (ICP-MS)

4873.1 Part 1: Principles and techniques

4873.2 Part 2: Quantitative determination—Water (this Standard)

The term ‘informative’ has been used in this Standard to define the application of the appendix to which it applies. An ‘informative’ appendix is only for information and guidance.

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STANDARDS AUSTRALIA

Australian Standard

Recommended practice for inductively coupled plasma mass spectrometry (ICP-MS)

Part 2: Quantitative determination—Water

1 SCOPE

This Standard specifies a method for the analysis of water samples for the following elements: aluminium, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, caesium, chromium, cobalt, copper, gallium, germanium, gold, lead, lithium, manganese, mercury, molybdenum, nickel, palladium, platinum, rhodium, rubidium, selenium, silver, strontium, tellurium, thorium, thallium, tin, titanium, uranium, vanadium, and zinc.

NOTES:

- 1 Other elements may be determined by this method if adequate performance is demonstrated. Depending on the sample pre-treatment, the method is applicable to the determination of dissolved and total recoverable elements. This Standard should be read in conjunction with AS 4873.1.
- 2 This Standard may be used as a guide for the determination of elements in other matrices provided adequate performance is demonstrated.
- 3 This method is suitable for the determination of elements in aqueous solutions where suspended or particulate material is $<0.1\%$ (w/v).
- 4 Water samples containing sediment or suspended particulate matter $>0.1\%$ (w/v) should be digested using methods for sediment (e.g. aqua regia digestion) before analysis.
- 5 This method is applicable for the determination of dissolved elements and total recoverable (acid extractable) elements. It is not suitable for the determination of 'total elements' concentrations unless appropriate procedures have been followed to ensure the dissolution of any silicates present.
- 6 This method is suitable for non-saline water. For the analysis of saline water, samples should be diluted to reduce dissolved solids to $<0.3\%$. Several elements are prone to interference from polyatomic ions originating from the matrix and appropriate techniques should be used for the determination of such elements.
- 7 Before any samples are taken, it should be established whether dissolved element concentrations or total recoverable element concentrations, or both, are required.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

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|--------------|---|
| 1678.8.0.008 | Emergency procedure guide—Transport—Hydrofluoric acid |
| 2508 | Safe storage and handling information card |
| 2830 | Good laboratory practice |
| 2830.1 | Part 1: Chemical analysis |
| 2850 | Chemical analysis—Interlaboratory test programs—For determining precision of analytical method(s)—Guide to the planning and conduct |
| 4873 | Recommended practice for inductively coupled plasma-mass spectrometry (ICP-MS) |
| 4873.1 | Part 1: Principles and techniques |