Australian Standard™

Analysis of soils

Part 4: Determination of metals in aqua regia extracts of soil by inductively coupled plasma-atomic emission spectrometry

This Australian Standard was prepared by Committee EV/9, Sampling and Analysis of Soils and Biota. It was approved on behalf of the Council of Standards Australia on 15 October 1999 and published on 5 December 1999.

The following interests are represented on Committee EV/9:

Agriculture Victoria

Association of Consulting Engineers Australia

Australian Collaborative Land Evaluation Program (ACLEP)

Australian Government Analytical Laboratories

Australian Institute of Environmental Health

Australian Institute of Medical Scientists

Australian Society of Soil Science Incorporated

CSIRO Land and Water

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EV/9, Sampling and Analysis of Soils and Biota. This Standard is the result of a consensus among the representatives of the Joint Committee to produce it as an Australian Standard.

This Standard is to provide an inductively coupled plasma atomic emission spectrometric method for the determination of metals in aqua regia extracts of soil. It should be read in conjunction with AS 3641.2, *Recommended practice for atomic emission spectrometric analysis*, Part 2: *Inductively coupled plasma excitation*.

This Standard is Part 4 of a series comprising:

AS
4479 Analysis of soils
4479.1 Part 1: Pretreatment of potentially contaminated soil samples for heavy metal and metalloid analysis
4479.2 Part 2: Extraction of heavy metals and metalloids from soil by aqua regia—Hotplate digestion method
4479.3 Part 3: Determination of metals in aqua regia extracts of soil by flame atomic absorption spectrometry
4479.4 Part 4: Determination of metals in aqua regia extracts of soil by inductively coupled plasma-atomic emission spectrometry

It has been assumed that executing the provision of this document is restricted to appropriately qualified chemists, familiar with the use of atomic emission spectrometers. This Standard calls for the use of procedures that may be hazardous or injurious to health, if adequate provisions are not taken.

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STANDARDS AUSTRALIA

Australian Standard

Analysis of soils

Part 4: Determination of metals in aqua regia extracts of soil by inductively coupled plasma-atomic emission spectrometry

1 SCOPE This Standard specifies an inductively coupled plasma-atomic emission spectrometric (ICPAES) method for the determination of one or more metals in aqua regia extracts of soils or related materials. Working solution concentration range is dependent upon instrument and operating conditions.

NOTE: This is an intricate procedure and should be performed only by an analyst familiar with the chemistry of the technique and the operational procedures of the instrument used.

2 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS
2162 Verification and use of volumetric apparatus
2162.1 Part 1: General—Volumetric glassware
2162.2 Part 2: Guide to the use of piston-operated volumetric apparatus (POVA)

2164 Laboratory glassware—One-mark volumetric flasks

2166 One-mark pipettes

2167 Graduated straight pipettes

2850 Chemical analysis—Interlaboratory test programs—For determining precision of analytical method(s)—Guide to the planning and conduct

3641 Recommended practice for atomic emission spectrometric analysis
3641.1 Part 1: Principles and techniques
3641.2 Part 2: Inductively coupled plasma excitation

4479 Analysis of soils
4479.2 Part 2: Extraction of heavy metals and metalloids from soil by aqua regia—Hotplate digestion method

AS/NZS
2243 Safety in laboratories
2243.1 Part 1: General
2243.2 Part 2: Chemical aspects

ISO
3696 Water for analytical laboratory use—Specification and test methods

3 DEFINITIONS For the purpose of this Standard, the definitions below apply.

3.1 Accuracy—the closeness of agreement between the test result and the true value.

3.2 Precision—the closeness of agreement between replicate test results obtained by applying the procedure under prescribed conditions.

3.3 Repeatability conditions—conditions where mutually independent test results are obtained on identical test material with the same method in the same laboratory by the same operator using the same equipment and within short intervals of time.