Australian Standard®

Copper

Part 2: Determination of copper content—Electrogravimetric method

This Australian Standard was prepared by Committee CH/10, Analysis of Metals. It was approved on behalf of the Council of Standards Australia on 9 May 1997 and published on 5 July 1997.

The following interests are represented on Committee CH/10:

AMDEL

Australasian Institute of Mining and Metallurgy

Australasian Railway Association

Australian Aluminium Council

Australian Chamber of Commerce and Industry

Australian Chamber of Manufactures

Bureau of Steel Manufacturers of Australia

Copper Technical Data Centre, Australia

Metal Trades Industry Association

National Association of Testing Authorities, Australia

The Royal Australian Chemical Institute

University of New South Wales

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CH/10, Analysis of Metals to supersede AS K208.1—1970.

The objective of this Standard is to provide an electrogravimetric method for the determination of copper content in high grade copper (>97%).

This Standard is the result of a consensus among Australia and New Zealand representatives of the Joint Committee to produce it as an Australian Standard.

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1 SCOPE This Standard sets out an electrogravimetric method for the determination of copper in blister, anode and high grade copper (copper content >97%). The method is particularly applicable in situations where impurities would normally interfere with the electrode deposition of copper.

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

AS
2134 Recommended practice for chemical analysis by atomic absorption spectrometry
2134.1 Part 1: Flame atomic absorption spectrometry
2162 Verification and use of volumetric apparatus
2162.1 Part 1: General—Volumetric glassware
2164 Laboratory glassware—One-mark volumetric flasks
2166 One-mark pipettes
2614 Copper and copper alloys—Sampling for chemical analysis and electrical resistivity
2850 Chemical analysis—Interlaboratory test programs—For determining precision of analytical method(s)—Guide to the planning and conduct

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

3 PRINCIPLE The copper sample is dissolved in nitric acid and arsenic, antimony, selenium and tellurium are oxidized to their higher oxidation states. Silver is removed as silver chloride. Bismuth is removed by coprecipitating on hydrated manganese oxide. Copper is then determined by electrode deposition.

4 REAGENTS

4.1 General requirements Except where specified otherwise, only reagents of recognized analytical grade and Type 2 water as specified in ISO 3696 shall be used. The purity of each metal and reagent used to prepare the standard solutions shall be greater than 99.99%.

4.2 Solutions

4.2.1 *Nitric acid (ρ_{20} 1.42 g/mL)*

4.2.2 *Nitric acid (1 + 3)* Slowly add 25 mL of nitric acid (4.2.1) to 75 mL of water while stirring continuously.

4.2.3 *Ammonium hydroxide solution (ρ_{20} 0.88 g/mL)*

4.2.4 *Potassium persulfate*