Australian Standard™

Methods for the analysis of rutile

Part 1: Determination of titanium content—Titrimetric method

Standards Australia

This Australian Standard was prepared by Committee MN-004, Heavy Mineral Sands. It was approved on behalf of the Council of Standards Australia on 1 October 2003 and published on 1 December 2003.

The following are represented on Committee MN-004:

Australian Institute of Mining and Metallurgy

Chamber of Minerals and Energy of Western Australia

Additional interests participating in the preparation of this Standard:

Producers of heavy mineral sand concentrates

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Part 1: Determination of titanium content—Titrimetric method

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PREFACE

This Standard was prepared by Standards Australia Committee MN-004, Heavy Mineral Sands, to supersede AS 2864.1—1987, *Methods for the analysis of rutile*, Part 1: *Determination of titanium content—Titrimetric method*. The objective of this Standard is to provide a method for use in settling disputes arising from discrepancies between buyer and seller in the determination of titanium in rutile.

The Committee previously organized an interlaboratory test program to obtain information on the precision of the method. The following laboratories participated in the test program to provide the data given in Table A1:

ARM Laboratories

Australian Laboratory Services

CSIRO, Division of Mineral Chemistry

Government Chemical Laboratories, W.A.

SCM Chemicals Ltd

Westralian Sands Ltd

The revision confirms the method for the determination of titanium content of rutile by the titrimetric method. Editorial changes have been made to bring the Standard into line with current style.

CONTENTS

STANDARDS AUSTRALIA

Australian Standard
Methods for the analysis of rutile

1 SCOPE

This Standard sets out a titrimetric method using aluminium reduction and ammonium iron (III) sulphate titration for the determination of the titanium content of rutile.

The method is applicable to rutile concentrates containing in excess of 90 percent TiO_2. The presence of chromium, vanadium and niobium, each at concentrations of up to 1 percent (expressed as oxide) has no effect on the result.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS
2243 Safety in laboratories (series)

2884 Heavy mineral sand concentrates—Sampling
2884.1 Part 1: Moving streams
2884.2 Part 2: Sampling from stationary situations
2884.3 Part 3: Preparation of samples

3 PRINCIPLE

Sintering of the test portion with sodium peroxide followed by leaching and filtration to remove chromium and vanadium. Two-stage wet ashing of the filter paper and titanium product with sulphuric acid and sodium hydrogen sulphate (or sodium pyrosulphate) and fusion of the product with sodium hydrogen sulphate (or sodium pyrosulphate). Dissolution in sulphuric and hydrochloric acids and reduction of the titanium with aluminium metal in the presence of citric acid added to overcome interference from niobium. Titration with ammonium iron (III) sulphate solution using potassium thiocyanate indicator.

4 SAFETY

For information on laboratory safety, reference should be made to AS 2243.

5 REAGENTS

5.1 General

During the analysis, use only reagents of recognized analytical reagent grade (except for 5.2.3 and 5.2.4), and only distilled water or water of equivalent purity.

5.2 Solids

5.2.1 *Sodium peroxide (Na_2O_2), fine powder.*

NOTE: Sodium peroxide should be kept away from humidity and should not be used once it has begun to agglomerate.

