

Australian Standard[®]

Methods of test for supplementary cementitious materials for use with portland cement

Method 10: Determination of alumina and total iron content

PREFACE

This Standard was prepared by the Standards Australia Committee on Supplementary Cementitious Materials for use with Portland Cement.

METHOD

1 SCOPE This Standard sets out the reference method for determination of alumina and total iron content in supplementary cementitious materials.

WARNING: OBSERVE SAFE PROCEDURES FOR DILUTING CONCENTRATED ACIDS AND ALKALIS AND WHERE TOXIC GASES ARE GENERATED.

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

AS

2162 Code of practice for the use of volumetric glassware

3753 Recommended practice for chemical analysis by ultraviolet/visible spectrophotometry.

3 PRINCIPLE A sample is decomposed by fusion with sodium hydroxide. The cooled melt is dispersed in boiling water followed by dissolution in hydrochloric acid. A test solution is made by diluting with water and the iron(II) oxide content is determined spectrophotometrically using ferron solution; the alumina content is also determined spectrophotometrically and is corrected for the contribution of the iron(II) oxide present.

4 REAGENTS

4.1 Purity of reagents All reagents shall be of analytical reagent grade and free from impurity levels which will significantly interfere with the determination of alumina and total iron by this method.

Distilled or demineralized water shall be used throughout the analysis.

4.2 General solutions and solids The following are required:

- (a) Ferron solution (0.15 percent in 2.5 mol/L acetate buffer) — dissolve 370 g sodium acetate trihydrate ($\text{CH}_3\text{COONa}\cdot 3\text{H}_2\text{O}$) in 800 mL warm water. Filter the solution through a glass filter funnel with a qualitative filter paper (see Note) and add 470 mL 5 mol/L acetic acid. In a separate container dissolve 3.00 g ferron (7-iodo-8-hydroxy quinoline-5-sulfonic acid) in 100 mL of 1 percent (m/V) sodium hydroxide solution. Decant into the acetate buffer solution. If necessary, use more sodium hydroxide solution to dissolve any remaining ferron. Finally dilute the buffer solution to 2 L and store in a container shielded from direct light.

NOTES:

1. Whatman No. 4 qualitative paper or equivalent has been found to be suitable.
2. This solution will darken and give high blank readings if left exposed to light. Its stability should be confirmed by weekly determinations of a blank.