Australian Standard®

Methods of testing portland and blended cements

Method 10: Calcium oxide content of blended cement

1 SCOPE This Standard sets out the reference method for determining the calcium oxide content of blended cement and its constituents. Alternative procedures are permitted provided that the alternatives do not significantly affect the results. A method of qualifying alternative procedures is given in Appendix A.

NOTE: Where test results are to be used to calculate the proportions of a blended cement, the same procedure, referee or alternate, should be used for analysis of the constituents and the blended cement.

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

AS
2162 Code of practice for the use of volumetric glassware
2706 Numerical values—Rounding and interpretation of limiting values
2830 Good laboratory practice
2830.1 Part 1: Chemical analysis

3 PRINCIPLE Sample portion is dissolved in nitric acid and the calcium oxide content determined by titration with EDTA using screened calcein indicator.

4 REAGENTS Reagents used shall be of an analytical reagent grade of purity, or the highest grade available where no analytical reagent is available. Distilled water, or water of equivalent purity shall be used.

The following reagents shall be used:

WARNING: SAFE PROCEDURES SHALL BE OBSERVED FOR DILUTING CONCENTRATED ACIDS AND ALKALIS, AND WHERE TOXIC GASES ARE GENERATED.

(a) *Nitric acid 1:1* One volume of concentrated nitric acid added to one volume of water.

(b) *Triethanolamine 1:1* One volume of triethanolamine added to one volume of water. Discard the solution if it becomes darker or more yellow than a pale straw colour.

(c) *Potassium hydroxide 20% (m/V)* 20 g potassium hydroxide dissolved in water and the solution diluted to 100 mL with water.

(d) *Calcein indicator (screened)* 0.2 g calcein indicator, 0.12 g thymolphthalein, and 20 g dry potassium chloride, ground to a homogeneous powder.

(e) *EDTA solution 0.05 mol/L* 18.612 g of ethylenediamine tetra-acetic acid disodium salt (EDTA) dissolved in water and the solution diluted to 1 L with water.

(f) *Calcium carbonate* Anhydrous ($CaCO_3$).

5 APPARATUS The following apparatus is required:

(a) *Analytical balances*—shall have a capacity appropriate to the weighing required and shall have an accuracy of ±0.2 mg in the range used.

(b) *Glassware*—shall be resistant to the chemicals used and, where applicable, shall comply with the requirements of AS 2162.

6 PROCEDURE

6.1 General The calcium oxide content shall be determined by the procedure given in Clauses 6.3.1, 6.3.2 and 6.3.3 and in accordance with the principles given in AS 2830.1. All analysis shall be carried out on an as-received basis unless otherwise requested.