Australian Standard®

Methods of testing portland and blended cements

Method 15: Water-soluble chromate content of portland cement

1 SCOPE This Standard sets out the method for determining water soluble chromate in portland cement.

2 APPLICATION This method of analysis shall be applicable to the direct estimation of water soluble chromate content in concentrations from 0.2 to 15 mg Cr^{6+}/kg.

NOTE: Sulfides will cause low measured values of water soluble chromate.

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

AS
2162 Code of practice for the use of volumetric glassware
2830 Good laboratory practice
2830.1 Part 1: Chemical analysis

4 PRINCIPLE The cement is leached with water and filtered. A part of the filtrate is added to s-diphenylcarbazide, which together with chromate in acid conditions forms a red-violet complex with maximum absorption at 540 nm. The colour of the complex is measured photometrically and is converted to content of water soluble chromate through a calibration curve.

5 REAGENTS Reagents used shall be of either an analytical reagent grade of purity or the highest grade available where no analytical reagent is available. Chromate-free distilled or demineralized water shall be used.

The following reagents shall be used:

(a) *Potassium permanganate 0.02 mol/L* Dissolve 0.3 g of $KMnO_4$ in 100 mL of water.

(b) *Sulfuric acid 1.8 mol/L* Add 96 mL of concentrated sulfuric acid to approximately 900 mL of water and dilute solution to 1000 mL. Add potassium permanganate 0.02 mol/L, dropwise until a faint pink colour remains.

WARNING: OBSERVE SAFE PROCEDURES FOR DILUTING ACIDS.

(c) *Ethanol (C_2H_5OH.sg 0.79)*

(d) *Indicator solution* Dissolve 0.125 g of 1,5-diphenylcarbazide $[(C_6H_5.NH.NH)_2CO]$ in 25 mL of ethanol in a 50 mL measuring cylinder. Add water to the 50 mL mark.

NOTE: The indicator solution will last for approximately 3 h.