

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 680

withdrawn 1980

CHEMICAL ANALYSIS OF CEMENTS

MAIN CONSTITUENTS OF PORTLAND CEMENT

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 680, *Chemical analysis of cements – Main constituents of portland cement*, was drawn up by Technical Committee ISO/TC 74, *Hydraulic binders*, the Secretariat of which is held by the Institut Belge de Normalisation (IBN).

Work on this question by the Technical Committee began in 1958 and led, in 1963, to the adoption of a Draft ISO Recommendation.

In February 1965, this Draft ISO Recommendation (No. 773) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Argentina	India	Poland
Australia	Ireland	Portugal
Austria	Israel	Romania
Belgium	Italy	Sweden
Czechoslovakia	Japan	Turkey
Denmark	Korea, Rep. of	U.A.R.
France	Netherlands	United Kingdom
Germany	New Zealand	U.S.S.R.
Hungary	Norway	Yugoslavia

One Member Body opposed the approval of the Draft :

U.S.A.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council which decided, in March 1968, to accept it as an ISO RECOMMENDATION.

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1. GENERAL INSTRUCTIONS

1.1 Reagents

All reagents should be of the analytical reagent grade.

1.2 Filter-paper

Filter-papers should be *ash-free*. Filter-papers with a close texture are called *slow*, filter-papers with a medium texture are called *medium* and filter-papers with an open texture are called *fast*.

1.3 Blank determinations

A blank determination is recommended in every case. If possible, it is best carried out with a substance of nearly the same composition as the sample to be analysed, but without the constituent to be determined; otherwise carry out all the described operations without introducing the sample.

2. DETERMINATION OF LOSS ON IGNITION

2.1 Procedure

Place 1 g of the sample in a weighed covered platinum crucible with a volume of 20 to 25 ml. Heat the crucible and its content to constant mass in a muffle furnace at a temperature of 925 ± 25 °C. The initial heating takes 15 ~~min~~ ^{minutes}; subsequent periods last 5 ~~min~~ ^{minutes}.

2.2 Expression of results

Calculate the percentage loss on ignition to the nearest 0.1 %.

NOTE. – If heating is carried out at a different temperature this fact should be mentioned in the test report.

3. DETERMINATION OF INSOLUBLE RESIDUE

3.1 Procedure

To 1 g of sample add 10 ml of cold water and whilst vigorously stirring the mixture add 5 ml hydrochloric acid ($d = 1.19$).

If necessary, warm the solution gently and disperse the sample with the flattened end of a glass rod until decomposition of the cement appears to be quite complete.

Dilute the solution to 50 ml and digest for 15 ~~min~~ ^{minutes} at a temperature just below boiling. Filter the residue on a medium filter-paper, wash six times with hot water. Transfer the filter-paper and its contents back to the reaction beaker. Add 100 ml of sodium hydroxide (10 g/l) and maintain the solution at a temperature just below boiling point for 15 min. In the presence of methyl red as indicator acidify the solution with hydrochloric acid, and add an excess amount equivalent to four or five drops of hydrochloric acid. Filter on a medium filter-paper and wash the residue twelve to fifteen times with a hot solution of ammonium nitrate (20 g/l).

Ignite the residue in a weighed crucible at 900 to 1000 °C to constant mass.