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METHODS OF CHEMICAL ANALYSIS OF MANGANESE ORES

DETERMINATION OF ZINC CONTENT

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 551, *Methods of Chemical Analysis of Manganese Ores—Determination of Zinc Content*, was drawn up by Technical Committee ISO/TC 65, *Manganese Ores*, the Secretariat of which is held by the Komitet standartov, Mer i Izmeritel'nyh Priborov pri Sovete Ministrov SSSR (GOST).

Work on this question by the Technical Committee began in 1957 and led, in 1959, to the adoption of a Draft ISO Recommendation.

In November 1962, this Draft ISO Recommendation (No. 540) 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:

Australia	India	Spain
Austria	Iran	U.A.R.
Burma	Ireland	United Kingdom
Chile	Italy	U.S.S.R.
Czechoslovakia	Japan	Yugoslavia
France	Poland	
Hungary	Romania	

One Member Body opposed the approval of the Draft:

Germany.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council which decided, in December 1966, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 551 December 1966

METHODS OF CHEMICAL ANALYSIS OF MANGANESE ORES

DETERMINATION OF ZINC CONTENT

(Atomic mass Zn: 65.38; molecular mass ZnO: 81.38)

1. GENERAL INSTRUCTIONS

1.1 In the following analysis, use a sample for chemical analysis of air-dried manganese ore, which has been crushed to a size not exceeding 0.10 mm and checked on a sieve of appropriate size.

Simultaneously with the collection of samples for the determination of zinc, take three more test samples for the determination of hygroscopic moisture.

Calculate the content of zinc in ore which is absolutely dry by multiplying the numerical results of the determination of zinc by the conversion factor K, as found from the following formula:

$$K = \frac{100}{100 - A}$$

where A = hygroscopic moisture content, per cent.

1.2 The determination of zinc in manganese ore is carried out by simultaneously analysing three samples of ore with two blank determinations to enable a corresponding correction in the result of the determination to be made.

Simultaneously and under the same conditions, carry out a check analysis of a standard sample of manganese ore, for zinc content.

The arithmetical mean of the three results is accepted as the final result.

The following conditions should be observed:

The maximum difference between the highest and the lowest results should not exceed double the absolute value of the permissible tolerance on the result of the analysis (for the corresponding interval of zinc content), shown in the table under clause 5.2, " Accuracy of method ".

The average result of the simultaneous check analysis of the standard sample of manganese ore for zinc content should not differ from the result shown in the certificate by more than the ± value of the permissible tolerance (for the corresponding interval of zinc content), shown in the table under clause 5.2, " Accuracy of method ".

For the analysis take a standard sample of the type of ore to which the sample being analysed belongs.

1.3 The test samples and the residues should be weighed to an accuracy of ± 0.0002 g.

1.4 Distilled water should be used during the procedure and for the preparation of solutions.

1.5 Meanings of the following expressions:

hot water (or solution) implies a temperature of the liquid of 60 to 70 °C
warm water (or solution) implies a temperature of the liquid of 40 to 50 °C
diluted (1 : 1), (1 : 2), (1 : 5), etc. means that

the first figure gives the number of parts by volume of concentrated acid or some other solution, and

the second figure gives the number of parts by volume of water.

1.6 Indications as to the concentration of solutions show the mass of solute (in grammes) in the corresponding volume of the solvent.

1.7 The following symbols and abbreviations are used:

CP	chemically pure
d	relative density
g	gramme
g/l	grammes per litre
l	litre
ml	millilitre
μ	micron
PFA	pure for analysis

2. PRINCIPLE OF METHOD

The method consists of the separation of zinc from the accompanying elements in the form of sulphide in formic medium and its precipitation in the form of complex salt of zinc mercurithiocyanate Zn [Hg $(CNS)_4$].