

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 310

METHODS OF CHEMICAL ANALYSIS OF MANGANESE ORES
DETERMINATION OF HYGROSCOPIC MOISTURE

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 310, *Methods of Chemical Analysis of Manganese Ores—Determination of Hygroscopic Moisture*, 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.

Work on this question by the Technical Committee began in 1954 and led, in 1957, to the adoption of a Draft ISO Recommendation.

In October 1958, this Draft ISO Recommendation (No. 243) was circulated to all the ISO Member Bodies for enquiry. It was approved by the following Member Bodies:

Austria	Hungary	Portugal
Bulgaria	India	Republic of
Burma	Ireland	South Africa
Chile	Italy	Romania
Czechoslovakia	Japan	United Kingdom
France	Netherlands	U.S.S.R.
Germany	Poland	

No Member Body opposed the approval of the Draft.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in July 1963, to accept it as an ISO RECOMMENDATION.

METHODS OF CHEMICAL ANALYSIS OF MANGANESE ORES

DETERMINATION OF HYGROSCOPIC MOISTURE

1. GENERAL INSTRUCTIONS

- 1.1 In the following analysis, use a sample for chemical analysis of manganese ore which has been crushed to a size not exceeding 0.10 mm and checked on a sieve of appropriate size.
- 1.2 The quantities for analysis should be weighed to an accuracy of ± 0.0002 g.
- 1.3 The determination of hygroscopic moisture is carried out simultaneously on three samples of the air-dried ore prepared for analysis.

The arithmetical mean of the three results is accepted as the final result. The maximum difference between the results should not exceed twice the absolute permissible tolerance, shown in the table under clause 3.2, "Accuracy of method".

2. PROCEDURE

Weigh 2 g of the ore sample (which has been air-dried under laboratory conditions) into a weighing bottle which has been previously dried at a temperature of 105 to 110 °C and weighed together with the stopper. Dry the sample in an oven at the same temperature. After 2 hours, close the bottle with the stopper, cool it in a desiccator for 20 to 30 min and then weigh. Just before weighing, slightly open the stopper, then quickly close it again. Repeat dryings several times for 25 min each, until constant mass is reached. If, after repeated drying, the sample increases in mass, then accept as final the mass preceding the increase. The difference in the mass of the stoppered bottle with the ore before and after drying should be accepted as the mass of hygroscopic moisture, in grammes, in the sample being analysed.

3. EXPRESSION OF RESULTS

3.1 Method of calculation

The percentage content of hygroscopic moisture is calculated from the following formula:

$$\text{H}_2\text{O} = \frac{(A - B) \times 100}{G} \text{ per cent}$$

where A = mass of weighing bottle with ore before drying, in grammes;
 B = mass of weighing bottle with ore after drying, in grammes;
 G = mass of sample of ore, in grammes.

3.2 Accuracy of method

The permissible tolerances, per cent (absolute value), are given in the table below:

Moisture content		Permissible tolerance (in absolute value)
from	to	
0.10 per cent	0.50 per cent	± 0.02 per cent
(over) 0.50 per cent	1.00 per cent	± 0.04 per cent
„ 1.00 per cent	5.00 per cent	± 0.10 per cent
„ 5.00 per cent		± 0.20 per cent