

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION R 671

CHEMICAL ANALYSIS OF STEEL AND CAST IRON

DETERMINATION OF SULPHUR

(METHOD AFTER COMBUSTION IN A CURRENT OF OXYGEN,
AND TITRATION WITH SODIUM BORATE)

1st EDITION
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BRIEF HISTORY

The ISO Recommendation R 671, *Chemical analysis of steel and cast iron – Determination of sulphur (Method after combustion in a current of oxygen, and titration with sodium borate)*, was drawn up by Technical Committee ISO/TC 17, *Steel*, the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question by the Technical Committee began in 1958 and led, in 1965, to the adoption of a Draft ISO Recommendation.

In February 1966, this Draft ISO Recommendation (No. 915) was circulated to all ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Argentina	Hungary	Romania
Australia	India	South Africa,
Austria	Israel	Rep. of
Belgium	Italy	Spain
Brazil	Japan	Sweden
Canada	Korea, Rep. of	Switzerland
Chile	Netherlands	Turkey
Czechoslovakia	New Zealand	U.A.R.
Denmark	Norway	United Kingdom
Germany	Poland	Yugoslavia

Three Member Bodies opposed the approval of the Draft :

France
Portugal
U.S.A.

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

CHEMICAL ANALYSIS OF STEEL AND CAST IRON

DETERMINATION OF SULPHUR

(METHOD AFTER COMBUSTION IN A CURRENT OF OXYGEN,
AND TITRATION WITH SODIUM BORATE)

1. SCOPE

This ISO Recommendation describes methods of combustion and titration for the determination of sulphur in steel and cast iron.

2. PRINCIPLE OF THE METHOD

2.1 Combustion

Metal chips are burnt in a small refractory boat introduced into a tube heated by an electric furnace and through which is passed a current of oxygen of known rate of flow. The temperature of the metal can be attained either by the temperature of the furnace itself (general case) or by the addition of a metal flux (particular case of refractory steels).

2.2 Titration

The gases resulting from combustion, freed from oxide dust, are absorbed by a solution of potassium sulphate and hydrogen peroxide and then titrated with standard sodium borate solution (see Note 8.6).

3. REAGENTS

- 3.1 *Oxygen*. Minimum purity 99 %, free from sulphur-bearing compounds.
- 3.2 *Soda asbestos* (particle size : approximately 2 mm) and *magnesium perchlorate* (particle size : approximately 2 mm).
- 3.3 *Absorbent solution*. Dissolve 5 g of potassium sulphate in 200 ml of boiled and cooled distilled water. Add 100 ml of hydrogen peroxide 100 volumes (30 %) and dilute to 2500 ml with boiled and cooled distilled water.
- 3.4 *Standard sodium borate solution*. Weigh 2.3839 g of sodium borate, $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$, analytical reagent quality, dissolve in boiled and cooled distilled water and make up the volume to 2000 ml with the same water.

1 ml = 0.010 % of sulphur for 1 g of test sample.
- 3.5 *Mixed indicator* (see Note 8.1). Dissolve 0.1 g of methylene blue and 0.3 g of methyl red (salt form) in water and dilute to 500 ml with water.