



Withdrawn in 1990

TECHNICAL REPORT 4830/II

Published 1978-04-01

ISO Technical Reports are subject to review within three years of publication, with the aim of achieving the agreements necessary for the publication of an International Standard.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Steel — Determination of low carbon contents — Part II : Titrimetric method after combustion

Acier — Dosage du carbone en faibles teneurs — Partie II : Méthode titrimétrique après combustion

FOREWORD

Technical Report 4830 was drawn up by Technical Committee ISO/TC 17, *Steel*, and approved by a majority of its members. The reasons which led to the publication of this document in the form of a Technical Report are given in the Introduction.

In January 1978, this document was submitted to the ISO Council, which approved its publication as a Technical Report.

CONTENTS

	Page
0 Introduction	2
1 Scope and field of application	2
2 Reference	2
3 Principle	2
4 Reagents	2
5 Apparatus	4
6 Sampling	4
7 Procedure	4
8 Expression of results	5
9 Notes	6
10 Test report	7

Figures

1 Diagram of complete apparatus	8
2 Diagram of titration vessel (I)	10
3 Tuyere for fitting to combustion tube (D)	10

UDC 669.1 : 546.26 : 543.24

Ref. No. ISO/TR 4830/II-1978 (E)

Descriptors : steels, low carbon steels, chemical analysis, determination of content, carbon, volumetric analysis.

© International Organization for Standardization, 1978 •

Price based on 10 pages

Printed in Switzerland

0 INTRODUCTION

Four methods for the determination of low carbon contents in steels have been examined by ISO/TC 17, namely :

- manometric (low-pressure);
- titrimetric (titration in non-aqueous medium);
- conductimetric;
- coulometric.

The results of experiments carried out in relation to these four methods have not allowed a decision to be taken on the adoption of any one of them as a standard method at the international level.

Consequently, it has been generally agreed, as a preliminary measure, to make all four methods available in the form of parts of a Technical Report, i.e. ISO/TR 4830.

1 SCOPE AND FIELD OF APPLICATION

This part of this Technical Report describes a titrimetric method for the determination of the total carbon content in pure iron and in steels after combustion in an electric resistance furnace.

The method is applicable to carbon contents between 0,005 and 0,1 %.

2 REFERENCE

ISO/R 377, *Selection and preparation of samples and test pieces for wrought steel.*

3 PRINCIPLE

Combustion of a test portion in an electric resistance furnace in a current of oxygen, in the presence of a fluxing agent which encourages the combustion (see note 9.10), converting the carbon to carbon dioxide, which is absorbed in a mixture of pyridine and 2-aminoethanol or of formdimethylamide and 2-aminoethanol, and which is at the same time titrated using thymol blue as indicator.

Calculation of the carbon content from the consumption of the standard volumetric solution. This solution is standardized against calcium carbonate (primary standard), which is heated to a temperature between 1 250 and 1 400 °C in the same furnace.

4 REAGENTS

During the analysis, use only reagents of recognized analytical quality, and only distilled water or water of equivalent purity.

4.1 Oxygen, purified.

Pass the current of oxygen through a combustion tube, filled with platinized asbestos (4.2.1) and placed in a heated furnace so that a 25 cm portion of the tube has a temperature of 600 to 625 °C. Pass the oxygen leaving the tube through absorption columns, filled respectively with soda lime (4.2.3) and soda asbestos (4.2.2).

4.2 Oxygen-purifying agents :

4.2.1 Platinized asbestos, with 10 % platinum.

4.2.2 Soda asbestos, grain size about 2 to 4 mm.

4.2.3 Soda lime, grain size about 2 to 4 mm.

4.3 Agents for absorbing sulphur oxides :

4.3.1 Manganese(IV) oxide, grain size about 0,7 to 1,5 mm; or

4.3.2 Hydrogen peroxide fixed on urea, grain size about 4 mm.

4.4 Fluxing agents : tin, iron or steel, having the lowest possible carbon content determined in accordance with 7.4.2.