Characterization of waste - Halogen and sulfur content - Oxygen combustion in closed systems and determination methods

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EESTI STANDARDIKESKUS

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 14582:2007 sisaldab Euroopa standardi EN 14582:2007 ingliskeelset teksti. Käesolev dokument on jõustatud 20.04.2007 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 14582:2007 consists of the English text of the European standard EN 14582:2007. This document is endorsed on 20.04.2007 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This standard specifies a combustion method for the determination of halogen and sulphur contents in materials by combustion in a closed system containing oxygen (calorimetric bomb), and the subsequent analysis of the combustion product using different analytical techniques. This method is applicable to solid, pasty and liquid samples containing more than 0,025 g/kg of halogen and/or 0,025 g/kg of sulphur content. The limit of detection depends on the element, the matrix and the determination technique used. Insoluble halides and sulphate present in the original sample or produced during the combustion step are not completely determined by these methods.	**Scope:** This standard specifies a combustion method for the determination of halogen and sulphur contents in materials by combustion in a closed system containing oxygen (calorimetric bomb), and the subsequent analysis of the combustion product using different analytical techniques. This method is applicable to solid, pasty and liquid samples containing more than 0,025 g/kg of halogen and/or 0,025 g/kg of sulphur content. The limit of detection depends on the element, the matrix and the determination technique used. Insoluble halides and sulphate present in the original sample or produced during the combustion step are not completely determined by these methods.

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Characterization of waste - Halogen and sulfur content - Oxygen combustion in closed systems and determination methods

Caractérisation des déchets - Teneur en halogènes et en soufre - Combustion sous oxygène en système fermé et méthodes de dosage

Charakterisierung von Abfällen - Halogen- und Schwefelgehalt - Sauerstoffverbrennung in geschlossenen Systemen und Bestimmungsmethoden

This European Standard was approved by CEN on 13 January 2007.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 14582:2006) has been prepared by Technical Committee CEN/TC 292 “Characterization of waste”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2007, and conflicting national standards shall be withdrawn at the latest by September 2007.

Anyone dealing with waste and sludge analysis should be aware of the typical risks of that kind of material irrespective of the parameter to be determined. Waste and sludge samples may contain hazardous (e. g. toxic, reactive, flammable, infectious) substances, which can be liable to biological and/or chemical reaction. Consequently these samples should be handled with special care. Gases which may be produced by microbiological or chemical activity are potentially flammable and will pressurise sealed bottles. Bursting bottles are likely to result in hazardous shrapnel, dust and/or aerosol. National regulations should be followed with respect to all hazards associated with this method.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

Sulphur and halogens (fluorine, chlorine, bromine and iodine) may be found in materials in various forms. During the combustion of these materials, corrosive and harmful compounds may be released. The determination of sulphur and halogens by oxygen combustion may be used to assess the suitability of waste for incineration.

The determination of the resultant halides and sulphate can be achieved by many different techniques, e. g. using atomic emission spectrometry, titrimetry or ion chromatography.

Another method, oxygen flask combustion by Schoeniger, did not pass the method validation due to lack of participants. This method is described in Annex A (informative).

1 Scope

This standard specifies a combustion method for the determination of halogen and sulphur contents in materials by combustion in a closed system containing oxygen (calorimetric bomb), and the subsequent analysis of the combustion product using different analytical techniques.

This method is applicable to solid, pasty and liquid samples containing more than 0,025 g/kg of halogen and/or 0,025 g/kg of sulphur content. The limit of detection depends on the element, the matrix and the determination technique used.

Insoluble halides and sulphate present in the original sample or produced during the combustion step are not completely determined by these methods.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 14346, *Characterization of waste — Calculation of dry matter by determination of dry residue or water content*

EN 15002, Characterization *of waste — Preparation of test portions from the laboratory sample*

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
sulphur content
sum of sulphur contained as organic and inorganic compounds that can be converted to sulphate by combustion and then absorbed or dissolved in an aqueous solution

3.2
halogen content
sum of halogens contained as organic and inorganic compounds that can be converted to halides (fluoride, chloride, bromide, iodide) by combustion and then absorbed or dissolved in an aqueous solution

NOTE Be aware that the above definitions are valid for this empirical EN only and do not comply with scientific definitions of sulphur and halogen content.

4 Principle

The sample is oxidized by combustion in a closed system (a bomb containing oxygen under pressure). Halogenated and sulphur containing compounds are converted to fluoride, chloride, bromide, iodide and sulphate, which are absorbed and/or dissolved in an absorption solution.

Several methods may be used for the determination of halides and sulphate concentrations in the absorption solution.

In general this method is applicable for concentrations over 0,025 g/kg depending on the element, matrix and the determination technique. It may be used for aqueous samples or samples that burn with difficulty, which involves the use of a combustion enhancer.