

SOLID FUELS

Sulphur content

Determination of total sulphur and its bonding forms

Tahkekütused

Väävlisisaldus

Üldväävli ja selle sidemevormide määramine

NATIONAL FOREWORD

This Estonian standard is

- is the identical English version of the Estonian Standard EVS 664:2017 and it has the same status as the original Estonian version. In case of interpretation disputes the original version applies;
- endorsed with a notification published in the April 2019 issue of the official bulletin of the Estonian Centre for Standardisation.

The proposition to prepare this standard has been presented by Technical Committee EVS/TC 57 „Processing of Oil Shale and Oil Shale Products“, it has been coordinated by the Estonian Centre for Standardisation.

The standard has been prepared by the Oil Shale Competence Center of Virumaa College of Tallinn University of Technology; the expert assessment of the draft was performed by: Maaris Nuutre, chemical engineer of the Chair of Industrial Thermal Engineering of Tallinn University of Technology; Galina Vesselova, head of laboratory of “VKG OIL AS”; Jelena Obolonskaja, head of chemical laboratory of “Enefit Energiatootmine AS”; Tatjana Šiškovskaja, head of central logistical laboratory of “Enefit Kaevandused AS”. The standard has been approved by EVS/TC 57.

The significant changes with respect to the replaced standard are the apparatus (instrumental) method added for the determination of total sulphur and amendments of wording in the remaining text of the standard for a better comprehension of the document.

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Introduction

Determination of sulphur content in various fuels and solid residues of their thermal processing has become constantly more important due to more severe environmental requirements. Due to this, instrumental methods are constantly more frequently used for the determination of total sulphur, including various element analysers, the construction of which enables determining sulphur content simultaneously with other major elements (carbon, hydrogen, nitrogen). This enables saving the time and labour spent on analyses compared to the standard Eschka method.

As the determination of total sulphur by instrumental method in fuels was not reflected in the former standard and it is used constantly more frequently, a need arose for revision of the standard.

Proceeding from the above-mentioned explanations, this revision includes the added part of instrumental method for the determination of total sulphur, and amendments of wording have been made in the remaining text of the standard mainly for ensuring better legibility of the text of the standard by dividing long descriptions into smaller sections.

1 Scope

This Estonian standard describes methods for the determination of total sulphur and its forms (sulphate, sulphide, pyritic, and organic sulphur) in peat, wood, oil shale, coal, and solid residues of their thermal processing and combustion.

2 Terms and definitions

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

2.1 Chemistry terms

2.1.1

total sulphur (*üldväävel*)

sulphur contained in a fuel as a sum of sulphate, sulphide, pyritic, and organic sulphur

2.1.2

sulphate sulphur (*sulfaatväävel*)

sulphur which is transferred into a solution upon the treatment of fuel with hydrochloric acid

2.1.3

sulphide sulphur (*sulfiidväävel*)

sulphur which evolves from a fuel as hydrogen sulphide under the action of hydrochloric acid. Sulphide sulphur is found mainly in the solid residues of thermal processing of solid fuels

2.1.4

pyritic sulphur (*püriitväävel*)

disulphide sulphur (*disulfiidväävel*)

sulphur which is converted into sulphate sulphur upon the oxidative treatment of fuel with nitric acid after the elimination of sulphide and sulphate sulphur, or sulphur which evolves as hydrogen sulphide upon the reductive treatment of a sample in hydrochloric acid medium

2.1.5

organic sulphur (*orgaaniliselt seotud väävel*)

residue obtained from total sulphur content upon the subtraction of sulphate, sulphide, and pyritic sulphur content

2.2 Terms for results evaluating

2.2.1

repeatability (*korduvus*)

the values of duplicate determination results if results have been obtained in the same laboratory in a short period of time, by the same operator, with the same equipment, on representative test portions taken from the same analysis sample may not differ more than by the value of repeatability limit

2.2.2

reproducibility (*korratavus*)

the values of determination results (each of which is an arithmetic mean of duplicate determinations) if determination has been performed in two laboratories, on a representative portions taken from the same sample after the last stage of its preparation may not differ more than by the value of reproducibility limit