

**Petroleum products - Determination of  
vanadium and nickel content -  
Wavelength-dispersive X-ray  
fluorescence spectrometry**

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and nickel content - Wavelength-dispersive X-ray  
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## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

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| <p>Käesolev Eesti standard EVS-EN ISO 14597:2001 sisaldab Euroopa standardi EN ISO 14597:1999 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 18.06.2001 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p> | <p>This Estonian standard EVS-EN ISO 14597:2001 consists of the English text of the European standard EN ISO 14597:1999.</p> <p>This document is endorsed on 18.06.2001 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p> |
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| <p><b>Käsitlusala:</b></p> <p>This standard specifies a method for the determination of vanadium and nickel in liquid petroleum products. It may also be applied to semi-solid and solid petroleum products that are either liquefied by moderate heating or completely soluble in the specified organic solvent mixture. The method is applicable to products having vanadium contents in the range 5 mg/kg to 1000 mg/kg, and nickel contents in the range 5 mg/kg to 100 mg/kg, although precision data have only been determined up to 100 mg/kg for vanadium and 60 mg/kg for nickel; higher contents may be determined by appropriate dilution.</p> | <p><b>Scope:</b></p> <p>This standard specifies a method for the determination of vanadium and nickel in liquid petroleum products. It may also be applied to semi-solid and solid petroleum products that are either liquefied by moderate heating or completely soluble in the specified organic solvent mixture. The method is applicable to products having vanadium contents in the range 5 mg/kg to 1000 mg/kg, and nickel contents in the range 5 mg/kg to 100 mg/kg, although precision data have only been determined up to 100 mg/kg for vanadium and 60 mg/kg for nickel; higher contents may be determined by appropriate dilution.</p> |
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ICS 75.080

**Võtmesõnad:** chemical analysis, determination of content, liquids, nickel, petroleum products, vanadium, x-ray fluorescence spectrometry

ICS 75.080

Descriptors: Petroleum products, vanadium content, nickel content, testing.

**English version**

**Petroleum products**

Determination of vanadium and nickel content – Wavelength-dispersive  
X-ray fluorescence spectrometry  
(ISO 14597 : 1997)

Produits pétroliers – Dosage du  
vanadium et du nickel – Spectrométrie  
de fluorescence X dispersive en  
longueur d'onde (ISO 14597 : 1997)

Mineralölerzeugnisse – Bestimmung  
des Vanadium- und Nickelgehaltes –  
Wellenlängendispersive Röntgenflu-  
oreszenz-Analyse (ISO 14597 : 1997)

This European Standard was approved by CEN on 1998-12-20.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

**CEN**

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

**Central Secretariat: rue de Stassart 36, B-1050 Brussels**

## Foreword

International Standard

ISO 14597 : 1997 Petroleum products – Determination of vanadium and nickel content – Wavelength dispersive X-ray fluorescence spectrometry,

which was prepared by ISO/TC 28 'Petroleum products and lubricants' of the International Organization for Standardization, has been adopted by Technical Committee CEN/TC 19 'Petroleum products, lubricants and related products', the Secretariat of which is held by NNI, as a European Standard.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, and conflicting national standards withdrawn, by July 1999 at the latest.

In accordance with the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard:

Austria, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 14597 : 1997 was approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in Annex ZA (normative).

## 1 Scope

This International Standard specifies a method for the determination of vanadium and nickel in liquid petroleum products. It may also be applied to semi-solid and solid petroleum products that are either liquefied by moderate heating or completely soluble in the specified organic solvent mixture. The method is applicable to products having vanadium contents in the range 5 mg/kg to 1 000 mg/kg, and nickel contents in the range 5 mg/kg to 100 mg/kg, although precision data have only been determined up to 100 mg/kg for vanadium and 60 mg/kg for nickel; higher contents may be determined by appropriate dilution.

Barium at concentrations above approximately 300 mg/kg interferes with the determination of vanadium, and iron at concentrations above approximately 500 mg/kg interferes with the determination of nickel. Other elements at concentrations above approximately 500 mg/kg may affect precision and accuracy due to spectral line overlap or absorption.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3170:1988, *Petroleum liquids — Manual sampling*.

ISO 3171:1988, *Petroleum liquids — Automatic pipeline sampling*.

## 3 Principle

The test portion and a manganese solution as internal standard are mixed in a given mass ratio and exposed, in a sample cell, to the primary radiation of an X-ray tube.

The count rates of excited metal and reference material are measured, and the ratio of these count rates calculated. The vanadium and nickel contents of the sample are determined from calibration curves prepared on the basis of calibration standards.