INTERNATIONAL
STANDARD

ISO
8691

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Petroleum products — Low levels of vanadium in liquid fuels — Determination by flameless atomic absorption spectrometry after ashing

Produits pétroliers — Détermination des basses teneurs en vanadium dans les combustibles liquides — Méthode par spectrométrie d'absorption atomique sans flamme après calcination

Reference number
ISO 8691:1994(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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Petroleum products — Low levels of vanadium in liquid fuels — Determination by flameless atomic absorption spectrometry after ashing

WARNING — The use of this International Standard may involve hazardous materials, operations and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This International Standard specifies a method for determining the vanadium content in the range of 0,4 mg/kg to 4,0 mg/kg in gas turbine fuels and domestic fuel oils by means of flameless atomic absorption spectrometry.

NOTE 1 Fuel oils containing vanadium may cause operational difficulties in the presence of sodium, for example, when being burnt in boilers or used for the operation of gas turbines.

2 Normative references

The following International 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 385-1:1984, *Laboratory glassware — Burettes — Part 1: General requirements.*

ISO 1042:1983, *Laboratory glassware — One-mark volumetric flasks.*

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

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

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

3 Principle

The sample is incinerated in a crucible and brought to glowing heat (500 °C) in a muffle furnace. The ash is dissolved in hydrochloric acid (1 mol/l), and the vanadium content in the hydrochloric acid solution is determined by flameless atomic absorption spectrometry.

4 Reagents and materials

During the analysis, use only reagents of recognized analytical grade, and water equivalent to Grade 3 of ISO 3696.

4.1 Hydrochloric acid, aqueous solution of concentration 1 mol HCl/litre solution.

4.2 Sulfuric acid, concentrated, 98 % (*m*/*m*) minimum H_2SO_4.

4.3 Sulfur, flowers, ash content maximum 10 mg/kg.

4.4 Xylene (dimethylbenzene).

4.5 Xylenesulfonic acid.

Pour 100 ml of xylene (4.4) and 50 ml of sulfuric acid (4.2) into a clean beaker. Stir the mixture and gradually raise the temperature to 95 °C ± 5 °C. Continue heating and stirring until just one clear phase remains (30 min to 40 min). Cool and transfer the xylenesulfonic acid to a clean, stoppered bottle.

NOTE 2 A thin layer of xylene may remain on the top.