INTERNATIONAL STANDARD

ISO 3771

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Petroleum products — Determination of base number — Perchloric acid potentiometric titration method

Produits pétroliers — Détermination de l'indice de base — Méthode par titrage potentiométrique à l'acide perchlorique

Reference number
ISO 3771:1994(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.

International Standard ISO 3771 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*.

This second edition cancels and replaces the first edition (ISO 3771:1977), which has been technically revised.

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Petroleum products — Determination of base number — Perchloric acid potentiometric titration method

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 the determination of basic constituents in petroleum products by potentiometric titration with perchloric acid in glacial acetic acid.

The constituents that may be considered to have basic characteristics include organic and inorganic bases, amino compounds, salts of weak acids (for example soaps), basic salts of polyacid bases, and salts of heavy metals.

Two variations of the method are described, Procedures A and B, using different titration solvent volumes and test sample masses.

NOTE 1 Round-robin tests on a series of unused and used oils and additive concentrates have shown the Procedures A and B to give statistically equivalent results.

The ranges of base number values for which precision values for the method have been established are:

unused oils — base numbers from 6 to 70;

additive concentrates — base numbers from 5 to 300;

used oils on which were employed the forward titration — base numbers from 5 to 27.

NOTE 2 During the development of the original test method (Procedure A) and the test method using reduced titration solvent volume (Procedure B), cooperative testing was done on samples covering a wide range of types of oils, of additive concentrates which are used to prepare these oils, and of service conditions of the oils. Nevertheless it was not possible to cover the complete range of base numbers. It is reasonable to suppose that interpolation within and extrapolation from the ranges actually tested will not introduce serious errors in the precision.

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

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

3 Definition

For the purposes of this International Standard, the following definition applies.

3.1 base number: The quantity of perchloric acid, expressed in terms of the equivalent number of milligrams of potassium hydroxide, required to titrate 1 g of sample dissolved in the specified solvent to a