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Petroleum products and hydrocarbons — Determination of sulfur content — Wickbold combustion method

*Produits pétroliers et hydrocarbures — Dosage du soufre — Méthode de combustion
Wickbold*

Reference number
ISO 4260:1987 (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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 4260 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Petroleum products and hydrocarbons — Determination of sulfur content — Wickbold combustion method

CAUTION — The procedure specified in this International Standard includes the combustion of hydrogen in glass apparatus or stainless steel apparatus (in the case of olefins), which is potentially hazardous, and all precautions should be carefully observed.

1 Scope and field of application

This International Standard specifies a method for the determination of total sulfur in petroleum products, natural gas and olefins. The method may be applied to products having sulfur contents in the range 1 to 10 000 mg/kg and is particularly suitable for distillates with total sulfur contents of less than 300 mg/kg. Test samples which are viscous, highly aromatic, or of high sulfur content may be first diluted with a sulfur-free solvent.

The method can be used for the determination of the total sulfur content of natural and refinery gases, also for substances supplied to the burner in the liquid state and for the determination of volatile sulfur in substances supplied to the burner in the gaseous state after vaporization from the liquid phase. It is not suitable for the determination of sulfur in heavy-duty engine oils. For the determination of sulfur in light olefins, see clause 13, special case.

NOTES

1 If required, total chlorine content of petroleum products can be determined by the usual volumetric, gravimetric or potentiometric methods for determination of the chloride ions present in the absorption solution after combustion by this method.

The inorganic bound chlorine has to be removed by water extraction prior to the burning procedure, otherwise interference will occur.

2 When viscous or solid materials, such as bitumen or heavy fuel oils, are burnt in a combustion boat, some of the sulfur may be bound to the ash retained in the boat. If this is the case, the sulfur bound in the ash has to be determined in the residue.

2 References

ISO 641, *Laboratory glassware — Interchangeable spherical ground joints.*

ISO 3170, *Petroleum products — Liquid hydrocarbons — Manual sampling.*

ISO 3171, *Petroleum products — Liquid hydrocarbons — Automatic pipeline sampling.*

ISO 4850, *Personal eye-protectors for welding and related techniques — Filters — Utilisation and transmittance requirements.*

3 Principle

Gaseous or liquid test portions are passed to the oxy-hydrogen flame of a suction burner where they are burnt with considerable excess of oxygen. Viscous or solid test samples are preferably dissolved in light petroleum/toluene blend and treated as liquid test samples or may be burnt in a stream of oxygen in a combustion boat.

The resulting sulfur oxides are converted into sulfuric acid by absorption in hydrogen peroxide solution. Depending on the sulfur content of the test portion, the sulfate ions in the absorption solution are determined using the method of analysis shown in table 1 and set out in clause 9.