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**Crude oil and petroleum products
— Determination of ash and sulfated
ash**

ICS 75.040 ; 75.080

Descriptors : petroleum, petroleum products, ash determination, sulphated ash determination, lubricating oils, chemical analysis and testing, additives, determination of content

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of International Trade and Industry through deliberations at Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law:

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Crude oil and petroleum products— Determination of ash and sulfated ash

Introduction This Standard is the Japanese Industrial Standard prepared based on **ISO 6245 Petroleum products—Determination of ash**, published in 1993 as the second edition and **ISO 3987 Petroleum products—Lubricating oils and additives—Determination of sulfated ash**, published in 1994 as the second edition, without modifying their technical contents.

1 Scope This Japanese Industrial Standard specifies the testing methods for ash of crude oil and of petroleum products (except greases) and for sulfated ash of unused lubricating oils including additives for lubricating oils and of additives for lubricating oils.

- Remarks 1** The ash of grease shall be tested according to the method specified in **JIS K 2220**.
- 2 The use of this Standard may involve hazardous chemicals, operations and equipment. This Standard does not purport to address all of the safety problems associated with its use. The user of these testing methods should establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.
 - 3 The normative references to this Standard are shown in Attached Table 1.
 - 4 The International Standards corresponding to this Standard are shown in Table 1.
 - 5 The foreign Standards related with this Standard are shown in Attached Table 2.

**Table 1 Corresponding International Standards
for testing method**

Name of testing method	Corresponding International Standard
Testing method for ash	ISO 6245 : 1993 <i>Petroleum products — Determination of ash</i>
Testing method for sulfated ash	ISO 3987 : 1994 <i>Petroleum products — Lubricating oils and additives — Determination of sulfated ash</i>

2 Definitions For the purpose of this Standard, the following principal definitions apply:

- (1) **ash** The residue when the carbonaceous substances produced by burning sample are incinerated and made to constant mass by further heating.
- (2) **sulfated ash** The residue when sulfuric acid is added to carbonaceous substances produced by burning sample and then heated to make constant mass.

3 Classification of testing methods The testing methods are classified into two classes as shown in Table 2.

Table 2 Classification of testing methods

Classification	Classification by application	Examples of applicable oil	Clause number
Testing method for ash	0.001 mass % to 0.180 mass % of ash contained in crude oil and petroleum products	Crude oil, heavy oil	4
Testing method for sulfated ash	0.005 mass % min. of sulfated ash contained in lubricating oil, etc.	Lubricating oil	5

4 Testing method for ash

4.1 Principle of test Weigh a sample into a crucible, burn the sample until it becomes carbonaceous substances, put it into an electric furnace, and heat at 775 °C.

When the carbonaceous substances have become ash completely, cool it in a desiccator as it is, weigh the mass and obtain the ash.

Remarks 1 This testing method applies to the determination of 0.001 mass % to 0.180 mass % of ash contained in crude oil and petroleum products.

2 This testing method is not applicable to the petroleum products with organic metal compound and phosphorus compound added.

4.2 Ash tester The ash tester shall be as follows :

- (1) **Crucible** A crucible made of platinum or porcelain, having capacity of 90 mL to 150 mL.
- (2) **Electric furnace** An electric furnace capable of adjusting the temperature at 775 °C ± 25 °C. It is desirable that appropriate holes are provided at the front and rear so as to allow to pass the air slowly by natural ventilation.
- (3) **Desiccator** A desiccator containing no desiccant.
- (4) **Chemical balance** A chemical balance capable of measuring the total mass of crucible and sample to the nearest 0.1 mg.
- (5) **Homogenizer** A homogenizer capable of mixing uniformly sediment, impurities, etc. of the sample.
- (6) **Filter paper** The filter paper of class 5C specified in **JIS P 3801**.

4.3 Reagents The reagents shall be as follows :

- (1) **2-propanol** 2-propanol specified in **JIS K 8839**.
- (2) **Toluene** Toluene specified in **JIS K 8680**.

4.4 Sampling and preparing method of sample The sample for testing shall be sampled and prepared according to the sampling method for the primary sample and the sampling and preparing method for the secondary sample specified in **JIS K 2251** or an equivalent method.