

INTERNATIONAL STANDARD

ISO
3596-1

First edition
1988-07-15



INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
ORGANISATION INTERNATIONALE DE NORMALISATION
МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Animal and vegetable fats and oils — Determination of unsaponifiable matter —

Part 1 :

Method using diethyl ether extraction (Reference method)

*Corps gras d'origines animale et végétale — Détermination de la teneur en matières
insaponifiables —*

Partie 1 : Méthode par extraction à l'oxyde diéthylique (méthode de référence)

Reference number
ISO 3596-1 : 1988 (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 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 3596-1 was prepared by Technical Committee ISO/TC 34, *Agricultural food products*.

ISO 3596 consists of the following parts, under the general title *Animal and vegetable fats and oils — Determination of unsaponifiable matter*:

Part 1 : Method using diethyl ether extraction (Reference method)

Part 2 : Rapid method using hexane extraction

Annex A of this part of ISO 3596 is for information only.

Animal and vegetable fats and oils — Determination of unsaponifiable matter —

Part 1 : Method using diethyl ether extraction (Reference method)

1 Scope

This part of ISO 3596 specifies the reference method using diethyl ether extraction for the determination of the unsaponifiable matter content of animal and vegetable fats and oils.

This method is not applicable to waxes and moreover gives approximate results with certain fats of high unsaponifiable matter content, for example with fats derived from marine animals.

Annex A describes a method using nine hexane extractions which gives similar results for many animal and vegetable fats and oils, but because of differences of solubility of some constituents of the unsaponifiable matter in the two solvents, the results may not be identical, the hexane method giving lower results. The hexane method may be used when climatic conditions, or regulations, do not permit the use of diethyl ether.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 3596. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 3596 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 661 : 1980, *Animal and vegetable fats and oils — Preparation of test sample*.

ISO 5555 : 1983, *Animal and vegetable fats and oils — Sampling*.

3 Definition

For the purposes of this part of ISO 3596, the following definition applies.

unsaponifiable matter : All the substances present in the product which, after saponification of the latter by potassium

hydroxide and extraction by a specified solvent, are not volatile under the specified operating conditions.

NOTE — The unsaponifiable matter includes lipids of natural origin such as sterols, higher hydrocarbons and alcohols, aliphatic and terpenic alcohols, as well as any foreign organic matter extracted by the solvent and not volatile at 103 °C (e.g. mineral oils) that may be present.

4 Principle

Saponification of the fat or oil by boiling under reflux with an ethanolic potassium hydroxide solution. Extraction of the unsaponifiable matter from the soap solution by diethyl ether. Evaporation of the solvent and weighing of the residue after drying.

5 Reagents

All reagents shall be of recognized analytical grade. The water used shall be distilled water or water of at least equivalent purity.

5.1 Diethyl ether, freshly distilled, free from peroxides and residue.

5.2 Acetone.

5.3 Potassium hydroxide, ethanolic solution, $c(\text{KOH}) \approx 1 \text{ mol/l}$.

Dissolve 60 g of potassium hydroxide in 50 ml of water and dilute to 1 000 ml with 95 % (V/V) ethanol. The solution should be colourless or straw-yellow.

5.4 Potassium hydroxide, aqueous solution, $c(\text{KOH}) \approx 0,5 \text{ mol/l}$.