



**DEAS 847-5: 2025**

ICS 71.100.70

## **DRAFT EAST AFRICAN STANDARD**

---

**Cosmetics — Analytical methods — Part 5: Determination of unsaponifiable matter**

**EAST AFRICAN COMMUNITY**

---



### Copyright notice

This EAC document is copyright-protected by EAC. While the reproduction of this document by participants in the EAC standards development process is permitted without prior permission from EAC, neither this document nor any extract from it may be reproduced, stored or transmitted in any form for any other purpose without prior written permission from EAC.

Requests for permission to reproduce this document for the purpose of selling it should be addressed as shown below or to EAC's member body in the country of the requester:

© East African Community 2025 — All rights reserved  
East African Community  
P.O. Box 1096,  
Arusha  
Tanzania  
Tel: + 255 27 2162100  
Fax: + 255 27 2162190  
E-mail: [eac@eachq.org](mailto:eac@eachq.org)  
Web: [www.eac-quality.net](http://www.eac-quality.net)

Reproduction for sales purposes may be subject to royalty payments or a licensing agreement. Violators may be prosecuted.

## Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 071, *Cosmetics and related products*

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

This second edition cancels and replaces the first edition (EAS 847-5:2017), which has been technically revised.

EAS 847 consists of the following parts, under the general title *Cosmetics — Analytical methods*:

- *Part 1: Glossary of terms*
- *Part 2: Determination of moisture content and volatile matter content*
- *Part 3: Determination of insoluble impurities*
- *Part 4: Determination of acid value and free fatty acids*
- *Part 5: Determination of unsaponifiable matter*
- *Part 6: Determination of melting point*
- *Part 7: Determination of specific gravity*
- *Part 8: Titre test*
- *Part 9: Determination of colour*
- *Part 10: Determination of acetyl value and hydroxyl value*
- *Part 11: Determination of allyl isothiocyanate*
- *Part 12: Determination of flash point by Pensky – Martens Closed Cap Tester*
- *Part 13: Determination of rancidity*

- *Part 14: Determination of Polenske value*
- *Part 15: Determination of ash content*
- *Part 16: Determination of lead, mercury and arsenic content*
- *Part 17: Determination of pH*
- *Part 18: Determination of thermal stability*
- *Part 19: Determination of non-ionic, anionic and cationic surfactant content*
- *Part 20: Determination of lather volume (foaming power)*
- *Part 21: Determination of free acid in oils*
- *Part 22: Determination of sulphur and sulphides in oils*
- *Part 23: Test for absence of grit in powders*
- *Part 24: Determination of matter insoluble in boiling water*
- *Part 25: Determination of fineness*
- *Part 26: Determination of boric acid*
- *Part 27: Determination of total fatty substance by gravimetric method*
- *Part 28: Determination of free caustic alkali*

# Cosmetics — Analytical methods — Part 5: Determination of unsaponifiable matter

## 1 Scope

This Draft East African Standard prescribes the test method for the determination of unsaponifiable matter in oils and fats for the cosmetics industry.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies

EAS 847-1, *Cosmetics — Analytical methods — Part 1: Glossary of terms*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EAS 847-1 apply.

. ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at <http://www.iso.org/obp>

— IEC Electropedia: available at <http://www.electropedia.org/>

## 4 Test method

### 4.1 Principle

The material is completely saponified with alcoholic potassium hydroxide solution and extracted with petroleum ether. The petroleum ether extract is washed with aqueous alcohol and then again with water. The washed ether extract is evaporated and the residue weighed. Unsaponifiable matter is the residue minus the fatty acid present in it, which is determined by titration with sodium hydroxide solution in alcoholic medium.

### 4.2 Apparatus

**4.2.1 Flat-bottomed or conical flask**, 250-mL - 300-mL capacity. An ordinary round, flat-bottomed flask fitted with a long glass tube which acts as a condenser, may also be used.

**4.2.2 Separating funnels**, 500-mL capacity

**4.2.3 Hot plate**

**4.2.4 Water bath**

4.2.5 Air oven

4.2.6 Desiccator

4.3 Reagents

4.3.1 Standardized ethanolic potassium hydroxide solution, 0.02N

4.3.2 Ethyl alcohol, aldehyde-free ethyl alcohol (95 % by volume) or absolute ethanol or rectified spirit

4.3.3 Phenolphthalein indicator solution, dissolve 1 g of phenolphthalein in 100 mL of ethyl alcohol

4.3.4 Petroleum ether, analytical grade 40 °C - 60 °C

4.3.5 Aqueous alcohol, containing 10 % (by volume) of ethyl alcohol

4.3.6 Standard sodium hydroxide solution, approximately 0.02 N

4.3.7 Acetone, free from evaporation residue

4.4 Procedure

4.4.1 Weigh approximately 5 g of the well-mixed sample into the flask. Add 50 mL of alcoholic potassium hydroxide solution (see 4.3.1). Boil gently but steadily under a reflux condenser for 1 h or until the saponification is complete. Wash the condenser with about 10 mL of ethyl alcohol, cool the mixture and transfer it to a separating funnel. Complete the transfer by washing the flask first with some ethyl alcohol and then wash with cold water. Altogether, add 50 mL of water to the separating funnel followed by an addition of 50 mL of petroleum ether.

4.4.2 Insert the stopper and shake vigorously for at least 1 min, releasing the pressure at intervals, and allow to settle until both the layers are clear. Transfer the lower layer containing the soap solution to another separating funnel, and repeat the ether extraction at least six times more using 50 mL of petroleum ether for each extraction. If any emulsion is formed, add a small quantity of ethyl alcohol or alcoholic potassium hydroxide solution.

4.4.3 Collect all the ether extracts in a separating funnel. Wash the combined extracts in the funnel three times with 25-mL portions of aqueous alcohol shaking vigorously and drawing off the alcohol-water layer after each washing. Again, wash the ether layer successively with 20-mL portions of water until the wash-water no longer turns pink on addition of a few drops of phenolphthalein indicator solution. Do not remove any of the ether layers. Transfer the ether layer to a tared flask containing a few pieces of pumice stone, and evaporate to dryness on a water-bath to leave residue. To remove the last traces of ether and water, place the flask in an air-oven at 105 °C for about 1 h.

4.4.4 Cool in a desiccator and weigh. Repeat the evaporation, cooling and weighing until a constant weight is obtained.

4.4.5 After weighing, take up the residue in 50 mL of warm neutral ethyl alcohol, containing a few drops of phenolphthalein indicator solution and titrate with standard sodium hydroxide solution.

5 Calculation

5.1 The weight (*B*), in grams, of the fatty acids in the extract (as oleic acid) shall be expressed using the formula below:

$$B = 0.282 VN$$

where

$V$  is the volume, in millilitres, of standard sodium hydroxide solution, and

$N$  is the normality of standard sodium hydroxide solution.

**5.2** The unsaponifiable matter, percent by mass, shall be expressed be expressed using the formula below:

$$\frac{(A - B)}{m} \times 100$$

where

$A$  is the mass, in grams, of the residue,

$B$  is the mass, in grams, of the fatty acids in the extract, and

$m$  is the mass, in grams, of the material taken for the test.

DRAFT EAST AFRICAN STANDARD FOR PUBLIC REVIEW

## Bibliography

EAS 847-5: 2017, *Cosmetics — Analytical methods — Part 4: Determination of unsaponifiable matter*

DRAFT EAST AFRICAN STANDARD FOR PUBLIC REVIEW

DRAFT EAST AFRICAN STANDARD FOR PUBLIC REVIEW