

British Standard Methods of analysis of

Fats and fatty oils

Part 2. Other methods

Section 2.16. Determination of copper — colorimetric method

Méthodes d'analyse des graisses et huiles fixes

Partie 2. Autres méthodes

Section 2.16. Dosage du cuivre — Méthode colorimétrique

Untersuchungsverfahren für Fette und Fettöle

Teil 2. Andere Verfahren

Abschnitt 2.16. Bestimmung des Kupfergehaltes — Farbenmessverfahren

IMPORTANT NOTE. It is essential that this Section be read in conjunction with the information in the 'General introduction' to BS 684, which is published separately.

1. Scope

This Section describes a method for the colorimetric determination of copper and is applicable to animal and vegetable fats. Methods for the determination of trace metals in fats using the atomic absorption spectrophotometric procedure are described in BS 684 : Section 2.18 (in course of preparation).

2. References

The following standards publications are referred to in this Section:

- BS 2021 Separating and dropping funnels
- BS 2734 Boiling flasks (narrow-necked), conical, flat bottom and round bottom

3. Principle

The fat is digested with nitric acid, extracted with light petroleum and the aqueous layer is diluted. A solution of zinc dibenzylidithiocarbamate is added to the diluted aqueous layer and the mixture is filtered. The optical density of the filtrate is then determined. A reference curve is prepared using a standard copper solution.

4. Reagents

The following reagents are required (see also BS 684 : General introduction).

- 4.1 *Light petroleum*, boiling range between 40 °C and 60 °C.
- 4.2 *Carbon tetrachloride*

4.3 *Hydrogen peroxide*, solution, 300 g/l (100 vols).

4.4 *Nitric acid*, concentrated, 70 % (m/m) (16N).

4.5 *Sulphuric acid*, concentrated, 98 % (m/m) (36N).

4.6 *Sulphuric acid*, solution, 5 % (v/v).

4.7 *Zinc dibenzylidithiocarbamate*, solution, 5 g/l in carbon tetrachloride.

4.8 *Copper*, standard solution, prepared by dissolving 0.157 g of copper sulphate pentahydrate ($\text{Cu SO}_4 \cdot 5\text{H}_2\text{O}$) in water containing 5 ml of sulphuric acid (4.6) and diluting to 200 ml (1 ml of the resulting solution \equiv 200 μg of Cu).

5. Apparatus

The following items of apparatus are required (see also BS 684 : General introduction).

5.1 *Flasks*, 250 ml capacity, round bottom, narrow-necked, complying with the requirements of BS 2734.

5.2 *Separating funnels*, 100 ml, complying with the requirements of BS 2021.

5.3 *Spectrophotometer*, capable of being operated in the region of 435 nm.

Wash all glass apparatus with warm nitric acid solution, 5 % (v/v), and rinse several times with water before use.

6. Sampling and preparation of sample for analysis

See BS 684 : General introduction.