

Australian Standard[®]

Methods of chemical and physical testing for the dairying industry

Method 2.3: Liquid milks—Determination of the iodide content of milk—Selective ion electrode method

PREFACE

This Standard was prepared by the Standard Australia Committee, FT-024, Food Products and Subcommittee FT-024-05, Dairy Products to supersede AS 2300.2.3—1981.

After a periodic review, the Committee recommended a new edition. This edition confirms the method without technical changes, but updates the referenced documents and reflects the current editorial style and includes a clause on uncertainty of measurement.

AS 2300 comprises a series of methods and related Standards for chemical and physical testing of milk and dairy products, including the preparation of samples for testing.

Standards in the AS 2300 series are divided into categories according to type of product to be tested, as follows:

AS

- 2300.1 General methods and principles
- 2300.2 Liquid milks
- 2300.4 Dried milk and dried milk products
- 2300.5 Condensed milk
- 2300.6 Cheese
- 2300.7 Butter
- 2300.8 Anhydrous milk fat
- 2300.9 Analysis of ice-cream and frozen milk products
- 2300.10 Caseins, caseinates and coprecipitates
- 2300.11 Cultured milk products

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

METHOD

1 SCOPE

This Standard sets out a method, using an iodide-selective electrode, for the determination of the iodide content of raw liquid milk and pasteurized milk.

NOTE: The result may not include protein-bound iodine.

2 APPLICATION

The method is applicable to raw liquid milk which is fresh, or freshly thawed if the sample was frozen, and which contains no added preservative.

The method is not applicable to milk that has undergone heat treatment other than pasteurization.

The method is not suitable for determining concentrations of iodide below 100 µg/L.

3 REFERENCED DOCUMENT

The following documents are referred to in this Standard.

AS

2300 Methods of chemical and physical testing for the dairying industry
2300.1.3 Method 1.3: General methods and principles—Determination of fat—
Gravimetric method

AS/NZS

2243 Safety in laboratories
2243.2 Part 2: Chemical aspects

4 PRINCIPLE

The method uses an iodide-selective electrode in combination with a reference electrode. The interaction between the iodide ion and the iodide-selective electrode produces an electric potential which, under certain conditions, is related to the iodide concentration. A millivoltmeter may be used to measure this potential, from which the iodide concentration is calculated or, alternatively, a specific ion meter may be used to read iodide concentration directly.

WARNING: THE USE OF THIS STANDARD MAY INVOLVE THE USE OF HAZARDOUS MATERIALS, OPERATIONS AND EQUIPMENT. THIS STANDARD DOES NOT PURPORT TO ADDRESS ALL THE SAFETY RISKS ASSOCIATED WITH ITS USE. IT IS THE RESPONSIBILITY OF THE USER OF THIS STANDARD TO ESTABLISH APPROPRIATE SAFETY AND HEALTHY PRACTICES AND DETERMINE THE APPLICABILITY OF LOCAL REGULATORY LIMITATIONS PRIOR TO USE. SEE AS/NZS 2243.2 FOR MORE DETAILS REGARDING LABORATORY SAFETY.

5 REAGENTS

5.1 General requirements

Use only reagents of recognized analytical reagent grade and which, except for potassium iodide, are free of iodide.

Water shall be freshly distilled or of equivalent purity.

5.2 Reagents

5.2.1 Ionic strength adjuster (ISA)

Dissolve 5.0 g potassium chloride (KCl) in water and make up to 100 mL.

5.2.2 *Electrode soaking solution*

Add 5 mL of iodide standard stock solution A (see Clause 5.2.4) to 100 mL of phosphate solution and make up to 1 L with water.

The phosphate solution used in the preparation of the electrode soaking solution is made by dissolving 50 g of disodium hydrogen phosphate (Na_2HPO_4) and 50 g of potassium dihydrogen phosphate (KH_2PO_4) in 1 L of water.

5.2.3 *Electrode cleaning solution*

Prepare as follows:

- Dissolve 4.5 ± 0.1 g of disodium dihydrogen ethylenediamine-NNN'N'-tetraacetate dihydrate in about 150 mL of water.
- Add 10 ± 0.1 mL of a 67 g/L solution of sodium hydroxide.
- Add 1.0 mL of non-ionic surfactant solution. The surfactant solution is made by mixing 1 volume of surfactant with 9 volumes of water.
- Make up to 1 L with water.

5.2.4 *Iodide standard stock solution A (100 000 μg iodide/L)*

Dissolve 0.1308 g of potassium iodide (KI), which has been previously dried at 120°C for 1 h, in water in a 1 L volumetric flask and make up to the mark with water. Store in an amber bottle away from direct sunlight. Discard after 3 months.

5.2.5 *Iodide standard solutions*

A selection of the following iodide standard solutions is required according to the type of meter used. Reference should be made to Clauses 7.4 and 7.5 to ascertain which solutions are to be prepared.

Prepare the solutions on the day of use and keep in an amber bottle away from direct sunlight.

- Standard solution B (10 000 μg iodide/L)
Add 10.0 mL of iodide standard stock Solution A into a 100 mL volumetric flask and make up to the mark with water.
- Standard solution C (2000 μg iodide/L)
Add 20.0 mL of iodide standard Solution B into a 100 mL volumetric flask and make up to the mark with water.
- Standard solution D (1000 μg iodide/L)
Add 10.0 mL of iodide standard Solution B into a 100 mL volumetric flask and make up to the mark with water.
- Standard solution E (500 μg iodide/L)
Add 25.0 mL of iodide standard Solution B into a 500 mL volumetric flask and make up to the mark with water.
- Standard solution F (200 μg iodide/L)
Add 2.0 mL of iodide standard Solution B into a 100 mL volumetric flask and make up to the mark with water.
- Standard solution G (100 μg iodide/L)
Add 1.0 mL of iodide standard Solution B into a 100 mL volumetric flask and make up to the mark with water.