

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard

METHODS OF CHEMICAL AND PHYSICAL TESTING FOR THE DAIRYING
INDUSTRY

PART 6—CHEESE

AS 2300.6.7

DETERMINATION OF TOTAL CARBOHYDRATE
(AS LACTOSE) IN CHEESE—ROUTINE METHOD

1 SCOPE. This standard sets out a procedure for a routine method for the determination of total carbohydrate (as lactose) in cheese.

2 APPLICATION. This method is applicable to the analysis of cheese and is quantitative for total carbohydrate only when the sample contains one carbohydrate. It is applicable to the determination of lactose in cheese which contains negligible amounts of carbohydrates other than lactose.

3 REFERENCES. This standard requires reference to the following Australian and British standards:

- AS CK 19 Code of Recommended Practice for the Chemical Analysis of Materials by Ultraviolet-visible Spectrophotometry
- BS 2648 Performance Requirements for Electrically-heated Laboratory Drying Ovens
- BS 3875 Optical Spectrophotometric Cells

4 PRINCIPLE. The sample is treated with sodium hydroxide and zinc sulphate to precipitate the protein. The carbohydrate is then reacted with phenol solution and concentrated sulphuric acid. The spectrophotometric absorbance at 490 nm is compared with that obtained with a standard lactose solution.

5 DEFINITION. For the purpose of this standard the following definition applies:
Total carbohydrate content—the percentage by mass of the substances determined by the procedure described herein, and expressed as lactose monohydrate.

6 REAGENTS.

6.1 General Requirements. Use only reagents of recognized analytical reagent grade and distilled or deionized water.

6.2 Reagents.

- (a) *Sodium hydroxide solution*, 20 g/L.
- (b) *Zinc sulphate solution*, 100 g/L $ZnSO_4 \cdot 7H_2O$.
- (c) *Sulphuric acid* (ρ_{20} 1840 kg/m³).
- (d) *Phenol solution*, 50 g/L (protect from light).
- (e) *Standard lactose solution* (10 g/L). Prepare an approximately 1.5 g/L benzoic acid solution by dissolving 0.4 g to 0.5 g of benzoic acid in 300 mL of water. Dissolve 2.000 g of lactose monohydrate in 150 mL of the benzoic acid solution and using benzoic acid solution, transfer quantitatively to a 200 mL volumetric flask. Make up to volume with benzoic acid solution.

NOTES:

- 1. This solution is stable at 4°C.
- 2. If saturated benzoic acid solution is used, crystals of benzoic acid form in the solution on refrigeration which may lead to incorrect volumes when pipetting, or which may block the pipette.

7 APPARATUS.

- (a) *Atmospheric oven* of the forced draught type, complying with BS 2648, and operating at $100 \pm 3^\circ C$.
- (b) *Electric blender*, capable of blending the sample of cheese with the sodium hydroxide solution (see Clause 8(a), (b) and (c)).
- (c) *Filter paper*, Whatman No 1, 150 mm.
- (d) *Spectrophotometer*, with 10 mm cells complying with BS 3875, set to operate at 490 nm.

