

SPECIFICATION FOR WHITE REFINED SUGAR

AMENDMENT NO. 1

December 1992

1. Page 4, Foreword

- (a) In item 1, *delete* the year of publication "1958" and *substitute* with "1969".
- (b) In item 2, *delete* the standard number "1969" and *substitute* with "1679".
- (c) In item 3, *delete* the year of publication "1964" and *substitute* with "1978".
- (d) In item 4, *delete* the year of publication "11th Edition, 1970" and *substitute* with "15th Edition, Vol. 1, 1990".
- (e) In item 6, *delete* the standard number "CAC /RM 1/8" and *substitute* with "Codex Stan – 1981".
- (f) After item 6, *insert* the following texts:
 - 7. ICUMSA, Report of the Proceedings 16th Session (1974) : Subj. 17. Rec 3,233.
 - 8. CARRUTHERS, A., R. H. HEANY & J. F. T. OLDFIELD (1965) : Int. Sugar J., 67,364.

2. Insert the following "Appendix I".

APPENDIX I

DETERMINATION OF SULPHUR DIOXIDE IN SUGAR

I.1 SCOPE AND FIELD OF APPLICATION

The method of CARRUTHERS *et al.*² is based on the colorimetric determination of SO₂ and its application to white sugars.

I.2 PRINCIPLE OF METHOD

The colour of a sulphite/rosaniline complex is measured photometrically, at a wavelength near to 560nm, after reaction with formaldehyde.

I.3 APPARATUS

- I.3.1** Photometer
- I.3.2** Volumetric flasks, class A, 100 and 1000 cm³
- I.3.3** Graduated pipette, class A, 10 cm³
- I.3.4** Pipettes, 2 and 10 cm³
- I.3.5** Burette, 10 cm³ graduated by 0.05 cm³
- I.3.6** Test Tubes

I.4 REAGENTS

- I.4.1** Rosaniline hydrochloride solution (saturated): rosaniline hydrochloride (1g) is suspended in 100 cm³ of distilled water, heated to 50°C and cooled with shaking. After standing for 48 h, the solution is filtered.
- I.4.2** Decolorised rosaniline solution: saturated rosaniline hydrochloride solution (4 cm³) is transferred to a 100 cm³ volumetric flask. After addition of concentrated hydrochloric acid (6 cm³), the mixture is made up to the mark. Decolorisation takes place in a short time, but the solution is allowed to stand for at least 1 h before use.
- I.4.3** Formaldehyde solution (0.2g/100 cm³): formaldehyde solution, 40% (5 cm³) is diluted to 1000 cm³.
- I.4.4** Pure sucrose solution: sucrose (100g), free of SO₂ is dissolved and made up to 1000 cm³.
- I.4.5** Sodium hydroxide solution, 0.1N.
- I.4.6** Iodine solution, 0.033N.
- I.4.7** Concentrated hydrochloric acid, 1.18g/cm³.
- I.4.8** Concentrated orthophosphoric acid, 1.75g/cm³.
- I.4.9** Standards sulphite solution, 0.0166M: sodium sulphite heptahydrate (0.5g) is dissolved and made up to 100 cm³ in pure sucrose solution (4.4). The titre of this solution is determined as follows. The solution (5 cm³) is diluted with distilled water to 100 cm³ and phosphoric acid (3 drops) added. It is then titrated with 0.033N iodine solution. Assuming that the amount of iodine solution required is n cm³ and that 1 cm³ of 0.033N iodine is equivalent to 1.068 mg SO₂, then the titre of the standard sulphite solution is calculated as $0.2n = K$.
- I.4.10** Dilute standard sulphite solution: 5 cm³ of standard sulphite solution (4.9) is diluted to exactly 100 cm³ with pure sucrose solution (4.4). The exact value of the sulphite content is calculated as follows from the titre found in 4.9 above:

$$\text{mg SO}_2/\text{cm}^3 = \frac{5 \times K \times 1.068}{100}$$

I.5 PROCEDURE

- I.5.1 Colour Development.** A sample of white sugar (40g) is dissolved in distilled water in a 100 cm³ volumetric flask. After addition of 0.1N sodium hydroxide (4 cm³), the contents of the flask are made up to the mark and mixed.

An aliquot (10 cm³) of the solution is transferred to a clean, dry test tube. Decolorised rosaniline solution (2 cm³) and formaldehyde solution (2 cm³) are added and the tube allowed to stand at room temperature for 30 min. The absorbance is measured in a 1 cm cell in a photometer at about 560nm.

- I.5.2 Standard Curve.** Aliquots of the dilute standard solution (1, 2, 3, 4, 5 and 6 cm³) are pipetted into a series of 100 cm³ volumetric flasks. To each flask is added 0.1N sodium hydroxide (4 cm³) and the contents made to the mark with pure sucrose solution (4.4) and mixed. From each flask an aliquot (10 cm³) is transferred to a clean, dry test tube and treated with decolorised rosaniline solution (2 cm³) and formaldehyde solution (2 cm³). After mixing, the contents of the tubes are allowed to stand for 30 min at room temperature, the absorbances measured as in I.5.1 and the results plotted on a graph.
- I.5.3 Result.** The concentration of sulphite is calculated by reference to the standard curve and the result expressed as mg SO₂/kg white sugar.