



Method 8.13 – Refined sugar: odour, odour on acidification and taste

1. Rationale

This method is applicable to white sugar. Granulated sucrose can easily pick up odours from the surrounding atmosphere and nearby materials, or through poor refining techniques or adverse conditions during shipment or storage. These odours can be transmitted to any product where they may result in an off-taste or odour to the detriment of the product. Some of the odoriferous compounds that may be present in granulated sucrose are only noticeable under acidic solution conditions.

2. Principle

For odour, a sugar sample is heated to 50°C and smelled. For odour on acidification, a 50°Bx solution is acidified with phosphoric acid, heated to 50°C and smelled. For taste, a 10°Bx solution is tasted. Since odour and taste is subjective it is recommended that the odour and taste tests be done by three different people until agreement is reached.

3. Apparatus

- 3.1 **Schott bottle:** 250 cm³
- 3.2 **Water bath** operating at ± 50°C
- 3.3 **Volumetric flask:** 100 cm³
- 3.4 **Top pan balance** readable to 0.01 g
- 3.5 **Pipette:** 1 cm³ graduated
- 3.6 **Glass beaker:** 100 cm³
- 3.7 **Watch glass** to cover the 100 cm³ glass beaker
- 3.8 **Measuring cylinder:** 100 cm³

4. Reagents

- 4.1 **Phosphoric acid** (75% m/V)

Phosphoric acid (H₃PO₄) is a corrosive acid and should only be handled while wearing gloves and safety glasses.

Weigh 75 g of phosphoric acid (1.58 kg/m³), transfer to a 100 cm³ volumetric flask container 20 cm³ of water and make to the mark. Always add the acid to water and not the other way around.

5. Procedure

5.1 Odour

- Pour some dry white sugar into a 250 cm³ Schott bottle (up to the 50 cm³ level).
- Screw on the cap and place the bottle in a water bath and heat to about $\pm 50^{\circ}\text{C}$.
- Let the bottle stand at $\pm 50^{\circ}\text{C}$ for about 15 minutes.
- Remove the bottle, unscrew the lid and smell the sugar immediately.

5.2 Odour on acidification

- Prepare a 50°Bx solution of the sugar sample by dissolving approximately 50 g of the sugar in 50 cm³ of distilled water in a 100 cm³ beaker.
- Cover the beaker with a watch glass.
- Remove the watch glass and smell the sugar solution at room temperature.
- Note any off-odour.
- Pour the solution into the Schott bottle.
- Add 0.2 cm³ phosphoric acid and mix.
- Screw on the cap and place the bottle in a water bath at $\pm 50^{\circ}\text{C}$.
- Smell the solution every 10 minutes over a period of 30 minutes.
- Note the nature of any off-odour.

5.3 Taste

- Prepare a 50°Bx stock solution by dissolving 30.00 ± 0.01 g of the sugar in 30 cm³ deionised water in the 100 cm³ beaker.
- Dilute 20 cm³ of the stock solution to 100 cm³ in a measuring cylinder with deionised water.
- Taste the solution.

6. Expression of results

6.1 Odour

Note any off-odours and report as "off odour". If no odours are detected, report as "no off odour".

6.2 Odour on acidification

Note any off-odours and report as "off odour". If no odours are detected, report as "no off odour".

6.3 Taste

Note the nature of any off-taste and report as "off taste present" or if no off-taste is detected then report as "no off taste".

7. References

The Coca-Cola Company (2006). *Granular Sucrose Specifications*, BO-SP-260: 9 pp.

SMRI (2004). Determination of the odour in white sugar. *SMRI Test Methods*, TM032.

SMRI (2004). Determination of the odour in white sugar on acidification. *SMRI Test Methods*, TM033.

SMRI (2004). Determination of the foreign taste in white sugar. *SMRI Test Methods*, TM034.