

## **DETERMINATION OF RESIDUAL SUGAR IN WINE**

As the fermentation begins to slow down, leaving a small amount of residual sugar in the wine, the hydrometer is no longer useful in determining the quantity or concentration of residual sugar in the wine.

There are two basic tests for determining the level of residual sugar in the fermented wine.

**PLEASE NOTE:** CLINTEST TABLETS are no longer being manufactured and therefore not available.

### **METHOD : QUANTITATIVE (ACCURATE) METHOD**

This procedure provides an accurate(quantitative) determination of the amount of residual sugar in wine expressed as grams /litre residual sugar.

The procedure involves using the Rebelein method incorporating six (6) solutions. This test is simple to perform and as long as quantities of each chemical are accurately dispensed during the test using volumetric pipettes then an accurate figure ( $\pm 5\%$ ) for the amount of residual sugar can be obtained.

### **PROCEDURE**

Decolourise Red Wine

1. Add 50ml of red wine to a 250ml glass beaker.
2. Add one teaspoon of decolourising carbon.  
Mix contents for 30 seconds.
3. Leave to stand for 3 minutes.
4. Fold a Whatman No.6 Filter paper into quarter segments (ie four parts) and fit inside a 50mm glass funnel. Add filter funnel to a 250ml flask
5. Pour contents of beaker into filter paper. If filtered liquid contains traces of carbon or is slightly pink in colour then re-add filtered wine back through filter paper.
6. Wait until 15 - 20ml of clear, non-coloured wine is obtained in the 250ml flask.

**In the case of White wines, proceed from step 7**

7. Using a 2ml volumetric pipette, transfer 2ml of the clear wine sample into a 250ml erlenmeyer (conical) flask. Mark flask - sample 1

If more than one sample of wine is to be tested, then pipette 2ml of each wine into a separate 250ml Erlenmeyer flask. ie sample 2, sample 3, etc.

Note: In order to achieve sufficient accuracy during the analysis, points 1 - 4 should be followed.

- (i) All solutions used in the analysis should be at room temp.(ie 18 – 22C)
  - (ii) When pipetting volumes of wine, draw the volume of liquid above the mark on the stem of the pipette (ie volumetric or graduated) and hold at this point. Wipe the outside of the pipette using tissue paper. Now transfer the tip of the pipette to the side of the neck of the flask and release pressure on the index finger in order to dispense the volume of wine into the flask. Allow the same amount of draining time (ie 3-5sec) from the pipette for each wine.
  - (iii) In order to avoid contamination of each 2ml sample of wine obtained, it is important to rinse the 2ml pipette between pipetting each sample of wine. This can be achieved by either drawing up 2ml of distilled water and discarding to waste or wiping the outside of the pipette with a tissue and drawing up a sample of the wine to be transferred, discarding to waste and then drawing another sample of the same wine for transfer to a 250ml flask.[Note procedure for pipetting step (ii)]
8. Now carry out the same procedure, this time using another a 2ml volumetric pipette to transfer 2ml of water into another 250ml conical flask. Mark this flask as “ BLANK “
  9. Using a volumetric pipette, transfer 10ml of Residual Sugar Soln No.1(ie RSS No.1) and 5ml of RSS No.2 into each of the erlenmeyer flasks. Mix and add boiling chips to each flask.
  10. Gently boil contents of each flask for 30 seconds then cool to room temperature using running water for a few minutes.
  11. When Cool, add in this order, 10ml of RSS No.3, No.4 and No.5 to each flask. The colour of the solution should then be dark blue or dark green – brown (khaki), depending on the amount of residual sugar in the original sample.
  12. Titrate the contents of each flask in turn with the thiosulphate solution (RSS No.6), to a cream endpoint by swirling the flask regularly with your left hand (assuming you are right handed or vice-versa for left handed analysts).

Calculation is as follows:

$$\text{Reducing Sugar(g/L)} = \text{Blank Titre} - \text{Titre of Wine}$$

For Example

If the Blank titre is 29.8ml and the Wine titre is 27.2ml then the residual sugar content is  $29.8\text{ml} - 27.2\text{ml} = 2.6\text{g/L}$

The reagents as given above will react with up to about 28g/L of reducing sugar. If the sugar content is higher, then of course dilution must be used.

For wines with a sugar content higher than 20g/L, dilution is normally required.