



Method 10.3 – Sugar traces: the α -naphthol test

1. Rationale

The method is applicable to water, boiler water and effluent. It is a qualitative test which is used to determine whether a sample contains traces of sugar or not. The test is easy and quick to perform and is ideally suited for routine checks.

2. Principle

The sample is reacted with a α -naphthol solution and sulphuric acid. A violet colour developing within 30 seconds of addition indicates the presence of sugar.

3. Apparatus

- 3.1 **Pipette:** 2 cm³
- 3.2 **Burette:** 50 cm³
- 3.3 **Dropper** or pasteur pipette
- 3.4 **Test tubes:** 30 cm³
- 3.5 **Test tube rack**
- 3.6 **Volumetric flask:** 500 cm³

4. Reagents

- 4.1 **Ethanol** (absolute alcohol)

Ethanol (CH₃CH₂OH) is a flammable liquid and is toxic to humans. Wear safety glasses during use to avoid contact with the eyes.

- 4.2 **α -Naphthol solution** (20%)

α -Naphthol (C₆H₄C₄H₃OH) is toxic, severely irritating and harmful if swallowed. Handle only while wearing gloves and safety glasses.

Weigh 100 g of α -naphthol and dissolve in 300 cm³ ethanol. Transfer quantitatively to a 500 cm³ volumetric flask and make to the mark with absolute alcohol. Store in a dark bottle to protect against sunlight.

- 4.3 **Sulphuric acid** (concentrated)

Sulphuric acid (H₂SO₄) is a corrosive acid and should be handled with gloves while wearing safety glasses.

5. Procedure

If the sample is not clear filter through fluted filter paper supported in a funnel which rests directly on a beaker. Pipette 2 cm³ of clear sample into a test tube.

Fill the burette with concentrated sulphuric acid. Add 5 drops of the α -naphthol solution with the dropper and mix. Add 5 cm³ of the sulphuric acid from the burette gently down the side of the test tube to form a lower liquid layer. When the addition is complete, mix well.

Sugar is present in the sample if a violet colour develops within 30 seconds of the addition of the sulphuric acid.

6. Expression of Results

Report the presence or absence of sugar in the sample.

7. References

SASTA (1985). *Laboratory Manual for South African Sugar Factories*. 3rd Edition: 368.