12. Chemical Methods

Determination of "Hot"-Viscosity of CBG (LBG)

(INEC-TC)

1 Principle of the method

A 1% (w/w) gum solution is prepared by dispersing the CBG(LBG) sample with Ethanol, adding distilled water, heating in an boiling water bath and cooling to 25°C. The viscosity of this solution is determined with a Brookfield Viscosimeter after 2 h.

2 Equipment and materials

2.1 Laboratory balance (0.01 g)

2.2 Boiling water bath

2.3 Thermostatised water bath at 25°C

2.4 Mechanical stirrer with INEC stirrer rod (**A**)

2.5 Brookfield Viscosimeter, at 20 rpm with spindle 3

2.6 Stop watch

2.7 Glass beaker 600 ml, wide form, diameter 9 cm. (**A, B**)

3 Reagents

3.1 Ethanol 96 – 99.9%

3.2 Deionised or distilled water (pH 6 -7)

4 Procedure

4.1 Weigh the glass beaker with the stirrer rod and note the weight. (**A**)

4.2 Weigh 5.00 g CBG(LBG) into the tared beaker and moisten with 10 ml ethanol.

4.3 Add 495 ml distilled water of room temperature by shaking the beaker and stirring by hand with the stirrer rod.

4.4 Start the stop watch.

4.5 Place the beaker in the boiling water bath. It is important that, without stirring the solution inside, the beaker and the water of the bath are on the same level. (**C**)

4.5 Connect the stirrer rod and start the stirrer.(**D**)

4.6 After exactly 25 min (on the stop watch) transfer the beaker with the stirrer to the thermostatised 25°C water bath.

4.7 Connect the stirrer rod again and start the stirrer.

4.8 After 105 min (on the stop watch) dry the beaker with the stirrer on the outside and weight it.

4.9 Replace the evaporated quantity with distilled water until the total weight of the content is 500.00 g

10 Put the beaker to the thermostatised water bath again, connect the stirrer rod again and start stirring.

4.11 After 120 min (on the stop watch) stop stirring, take out the beaker from the bath, remove the stirrer rod and measure the Viscosity on the Brookfield Viscosimeter using spindle 3 and speed 20 rpm. Take the reading after 30 seconds.

5 Reporting of the results

If necessary, the viscosity is calculated according to operation manual of the Brookfield Viscosimeter.

The Hot-Viscosity is expressed in mPa*s as 1% solution after 2 h, at 25° C, measured with a Brookfield Viscosimeter at 20 rpm with spindle 3

6 Remarks

A For routine work it is advisable to prepare a separate weight to calibrate the balance for each stirrer rood in use and to tare all the glass beakers and to engrave the weight on the beaker.

B For the heat transfer it is important to work with glass beaker defined under 2.7. In this way the surface in contact with the hot water in the boiling water bath is standardised.

C The position of the beaker is important for the surface in contact with the hot water.

D Select a stirrer speed between 60 rpm and 100 rpm to avoid sprinkling and air bubbles in the solution.

INEC stirring rod