



Benedict's Quantitative Reagent

R003

Benedict's reagent is used to test for the presence of reducing sugars.

Composition**

Ingredients

Copper sulphate	18.000 gm
Sodium carbonate	100.000 gm
Sodium citrate	200.000 gm
Potassium thiocyanate	125.000 gm
Potassium ferricyanide	250.000 gm
Distilled water	1000.000 ml

**Formula adjusted, standardized to suit performance parameters

Directions

Take 5ml of the reagent in a flask. Add 2-3 gms of anhydrous sodium carbonate. Mix well and heat the mixture to boiling. Add urine dropwise using a graduated pipette with constant stirring, till the blue colour of the reagent disappears and white precipitate is formed. 0.5% glucose solution can be used as positive control.

Principle And Interpretation

Benedict's quantitative reagent is a modification of qualitative aspects. It contains copper sulphate-sodium carbonate. It also contains potassium thiocyanate and small amount of potassium ferricyanate. The thiocyanate causes with the precipitation of white cuprous thiocyanate rather than red cupric oxide. On the reduction of Cu^{3+} ions, which inhibits the end point of the titration digest the transition from blue to white to be readily observed. The small amount of potassium ferricyanide prevents the pre oxidation of copper. The reduction of Cu^{3+} ions by sugar is a non-stoichiometric equation and is only constant over a small range of sugar concentration. To obtain accurate results the volume of sugar added must be within 6-12ml for 10ml of Benedict's reagent.

Type of specimen

Clinical samples

Specimen Collection and Handling

For clinical samples follow appropriate techniques for handling specimens as per established guidelines (2,3).

After use, contaminated materials must be sterilized by autoclaving before discarding.

Warning and Precautions :

In Vitro diagnostic Use only. Read the label before opening the container. Wear protective gloves/protective clothing/eye protection/ face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets

Performance and Evaluation

Performance of the product is expected when used as per the direction on the label within the expiry period when stored at recommended temperature.

Quality Control

Appearance

Blue coloured solution

Clarity

Clear to very slightly opalescent solution.

Test

Take 5 ml urine in a flask, add 10 gm of sodium carbonate and 15-20 mg of Calcium carbonate. Mix well and then add 25 ml of Benedict's Quantitative reagent. Heat the solution to boiling for complete dissolution. Cool it to room temperature and titrate against 0.5% glucose solution.

Results

About 10 ml of 0.5% glucose solution is required to decolourise 25 ml of Benedict's Quantitative Reagent solution.

Storage and Shelf Life

Store between 10-30°C in tightly closed container and away from bright light. Use before expiry date on label. On opening, product should be properly stored in dry ventilated area protected from extremes of temperature and sources of ignition. Seal the container tightly after use.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques (2,3).

Reference

1. Benedict, S.R. "A Reagent for the detection of Reducing Sugars", J. Biol. Chem. 5(6):485-487.
2. Isenberg, H.D. Clinical Microbiology Procedures Handbook. 2nd Edition.
3. Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock, D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.

Disclaimer :

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