



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.

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 at 10-30°C in tightly closed container. Use before expiry period on the label.

Reference

1. Benedict, S.R. "A Reagent for the detection of Reducing Sugars", J. Biol. Chem. 5(6):485-487.

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