

Experiment No.(4) Benedict's test:

- Benedict's test is used to detect the presence of reducing sugar.
- The principle of Benedict's test is the reduction of Copper (II) ions (Cu^{+2}) to Copper (I) oxide (Cu_2O).

Material:

1. Carbohydrate solution (glucose 1-2 %).
2. Benedict reagent consists of two solutions A and B.
 - **Solution A:** prepared from dissolving 100 g of sodium citrate ($\text{Na}_3\text{C}_6\text{H}_5\text{O}_7$) in 600 mL of warm distilled water. Add 90 g of anhydrous sodium carbonate (Na_2CO_3). Boil the solution until the salts completely dissolve.
 - **Solution B:** prepared from dissolving 175 g of Copper (II) sulfate pentahydrate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$) in 100 mL of distilled water.
 - Both solutions are mixed and the total volume is completed to 1 liter and is kept in cold place.

Method:

1. Take 5 mL of Benedict reagent in a test tube.
2. Add 1 mL of carbohydrate solution to Benedict reagent and mix well.
3. Put the test tube in water bath and let it boil for some time.
4. A red or orange or reddish green colored precipitate appears. This precipitate is Copper (I) oxide (Cu_2O).
5. Benedict test is preferred on Fehling test if the carbohydrate solution is of low concentration as the detection of sugar in urine.

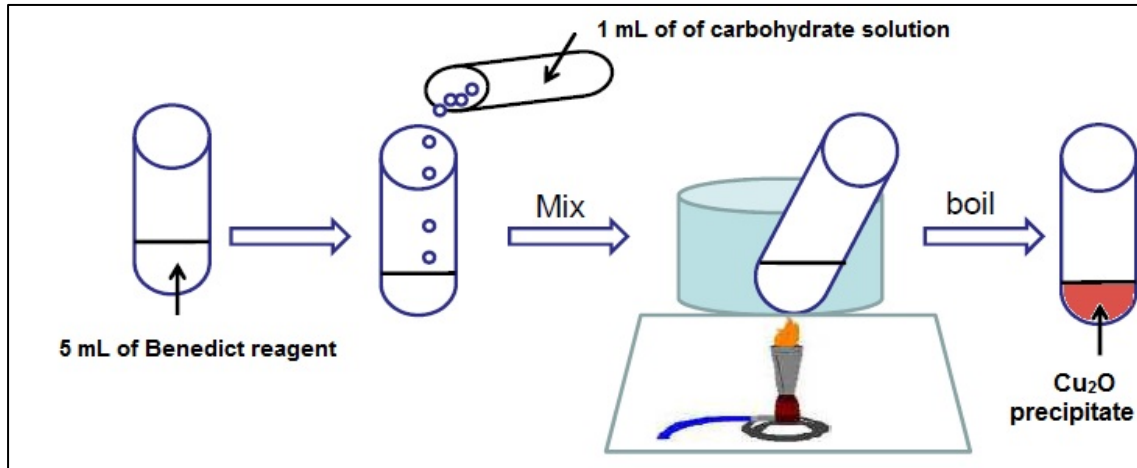


Figure 4. Procedure to Benedict's Test