

Body fluids Milk and bile

Experiment 1. Chemical composition of milk

Protocol.

Obtaining of milk proteins

Take 10cm³ of milk to beaker, add 20 cm³ H₂O and 7 drops of glacial CH₃COOH. Caseous sediment of casein and lipids will precipitate. Drain sediment of casein and lipids with 2 filter papers and remove. Add 1,5 cm³ 10% Na₂CO₃ to obtained filtrate, pH of sample should be 8 (check with strip indicator). Boil the solution. Precipitated sediment of lactoalbumin and lactoglobulin filtrate with filter paper and remove.

Use obtained filtrate for further determinations:

1. Detection of lactose

Take 1 cm³ of filtrate to glass tube and add 1 cm³ of Benedict or Fehling reagent. Boil for few minutes. As positive result of presence of lactose red sediment of Cu₂O will be formed.

2. Detection of Cl⁻ ions

Take 1 cm³ of filtrate to glass tube, add 4 drops of concentrated HNO₃, and 0,1 mol/dm³ AgNO₃. As positive result white, caseous precipitate of AgCl will be formed.

3. Detection of Ca⁺² ions

Take 1 cm³ of filtrate to glass tube and add 0.5 cm³ ammonium oxalate (szczawian amonu - (NH₄)₂C₂O₄). As positive result white cloudiness of calcium oxalate (CaC₂O₄) will be formed.

4. Detection of PO₄⁻³ ions

Take 1 cm³ of filtrate to glass tube, add 1 cm³ of concentrated HNO₃ and 0.5 cm³ ammonium molybdate solution (molibdenian amonu). Heat it carefully over the burner to boil. As positive result yellow precipitate of ammonium phospho-molybdate will be formed.

Experiment 2. Detection of fat in milk

Protocol.

1. Detection of fat in milk

Take 3 cm³ of „Phenoloftalein” milk and add 2 cm³ of pancreatic lipase. After mixing the solutions incubate in 40° C. Observe when milk will decolor, explain the course of experiment.



Experiment 3. Detection of bile acids

Protocol.

1. Reaction of Hay with "sulfur flower" (kwiat siarkowy)

Take 2 glass tubes and add 2 cm³ of water to each. Add 1 drop of bile to one tube. Add "sulfur flower" to both tubes and compare the results. "Sulfur flower" will fall down in tube with bile - explain this reaction.

2. Emulsifying properties of bile

Take 2 glass tubes and add 5 cm³ of water and few drops of oil to both. Add one drop of bile to one tube. Both tubes mix vigorously and observe the behaviour of emulsion in both tubes.

3. Reaction of Pettenkofer - detection of bile acids

Take 1 cm³ of bile, add few crystals of saccharose and gently 1 cm³ of concentrated H₂SO₄. Red ring will be formed on the border between solutions.

4. Detection of bilirubin - reaction of Gmelin

Take 1 cm³ of bile and add gently concentrated HNO₃. Coloured rings of products of bilirubin oxidation will be formed on the border of solutions.

