

Lab sheet #1**-Physical properties and detection of normal constituents of urine -****Objectives:**

- Simple examination of Urine.
- To detect some of the normal organic and inorganic constituents of urine (Qualitative).

Method:

Notice that there're 4 urine samples (A, B, C and D)

A. Physical Examinations (sample C):

1. Volume:
- Measure the volume of the 24-hour collection of normal urine.
2. Odour:
- State whether it is normal urine like ammonical, or not.
3. Colour:
- Visually examine its colour.
4. Appearance:
- State whether it is clear, cloudy or whether deposits or precipitates are present.
5. pH:
- Record the pH of the sample by test strips.
6. Specific gravity:
- Record the specific gravity of the sample by test strips.

B. Chemical Examinations:**(1) Organic:****A. Uric acid:**

1. To 2 ml of urine D add 1 ml of Benedict reagent.
2. Then heated in a boiling water bath for three minutes.
3. Appear of white precipitate indicates the presence of uric acid.

B. Creatinine:

1. To about 5 ml of urine A add 1ml of saturated solution of picric acid.
2. On rendering the solution alkaline with one drop of saturated sodium hydroxide solution, a deep red color or orange due to creatinine picrate appears.

(2) Inorganic:**A. Chloride:**

1- Add 5 ml of Urine B +5 drops of 2N nitric acid+ 3 drops 2N silver nitrate solution (be careful).

→ A white precipitate of silver chloride is formed (Silver chloride is precipitated in the presence of nitric acid and silver nitrate).

B. Phosphate:

1- Add 5 ml of urine A +5ml of concentrated nitric acid (carefully) + 4 ml of saturated ammonium molybdate solution, then heat in water bath for three minutes.

→ A yellow crystalline precipitate of ammonium phospho-molybdate appears.

C. Bicarbonate:

1- Add 5 ml of urine A+ 4 drops of concentrate hydrochloric acid (carefully)

→ A slight effervescence occurs due to CO₂ evolution.

D. Sulphate:

1- To Acidify add 5 ml of urine A with 1ml dilute hydrochloric acid + 2 drops of 5% barium chloride solution.

→ A white precipitate sulphate is precipitated as of barium sulphate is formed.

E. Ammonia:

1- Add 1 ml of 10% sodium hydroxide solution + 5 ml of urine B, then heat in water bath.

→ The ammonia may be detected by turning the red litmus paper to blue color.

-Results:**A. Physical Examinations:**

	Reference value	Result
Volume	800-2500 ml	
Colour	Amber in color	
Odour	Urine like	
Appearance	Clear	
pH	5.5 - 8.0, with a mean of 6	
Specific gravity	1.010 - 1.025	

B. Chemical Examinations:**(1) Organic:**

	Observation
Uric acid	
Creatinine	

(2) Inorganic:

	Observation
Chloride	
Phosphate	
Bicarbonate	
Sulphate	
Ammonia	