**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:**

**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 Bendect 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 1ml of 10% 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 carefully) .

🡺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+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

🡺 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** |  |