Name: _____ Group: _____ Date: _____

LAB 61
OBSERVATION

THE COMPOSITION OF URINE

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Goal

Determine which of four synthetic urine samples most closely resembles natural urine.

Observation criteria

1. What substances are normally found in urine?

_____

_____

_____

2. Provide four examples of substances that if found in urine signal a health problem.

_____

_____

_____

3. For each indicator in the table below, identify:

a) what nutrient it can detect.

b) its reaction when the substance tested does not contain the nutrient.

c) its reaction when the substance tested contains the nutrient.

Indicator	Nutrient detected	Reaction when nutrient not present	Reaction when nutrient present
Fehling's reagent			
Sudan IV			
Biuret reagent			
Silver nitrate			

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Materials

- marker
- 4 test tubes (18 mm × 150 mm) and stoppers (no. 1)
- test-tube rack
- dropper bottle of urine sample A
- dropper bottle of urine sample B
- dropper bottle of urine sample C
- dropper bottle of urine sample D
- 400-mL beaker
- hot plate
- dropper bottle of Fehling's reagent solution A
- dropper bottle of Fehling's reagent solution B
- test-tube clamp
- glassware soap
- test-tube brush
- wash bottle of distilled water
- weighing pan with Sudan IV particles
- spatula
- dropper bottle of biuret reagent
- dropper bottle of silver nitrate solution

Procedure

Initial examination of urine

1. Identify each test tube from A to D with the marker.
2. Add 20 drops of each urine test sample to its test tube.
3. Observe and record the colour of each sample.
4. Smell each sample. Record the odour emitted.

Fehling's test

1. Pour 200 mL of distilled water into the beaker.
2. Boil the beaker contents.
3. Add 10 drops of Fehling's reagent solution A to each test tube.
4. Add 10 drops of Fehling's reagent solution B to each test tube.
5. Place the test tubes into boiling water for 5 minutes.
6. Observe the contents of the test tubes. Record your observations.
7. Dispose of the contents of the test tubes as directed by your lab instructor.
8. Clean the test tubes with soap and the brush.
9. Rinse the test tubes with distilled water.

Sudan IV test

1. Add 20 drops of each urine test sample to its test tube.
2. Add a few particles of Sudan IV to each test tube.
3. Stopper the test tubes tightly.
4. Shake the test tubes vigorously. Set aside the test tubes for 2 minutes.
5. Observe the contents of the test tubes. Record your observations.
6. Dispose of the contents of the test tubes as directed by your lab instructor.

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7. Clean the test tubes with soap and the brush.
8. Rinse the test tubes with distilled water.

Biuret's test

1. Add 20 drops of each urine test sample to its test tube.
2. Add 7 drops of biuret's reagent to each test tube.
3. Observe the contents of the test tubes. Record your observations.
4. Dispose of the contents of the test tubes as directed by your lab instructor.
5. Clean the test tubes with soap and the brush.
6. Rinse the test tubes with distilled water.

Silver nitrate test

1. Add 20 drops of each urine test sample to its test tube.
2. Add 4 drops of silver nitrate to each test tube.
3. Observe the contents of the test tubes. Record your observations.
4. Dispose of the contents of the test tubes as directed by your lab instructor.
5. Clean the test tubes with soap and the brush.
6. Rinse the test tubes with distilled water.
7. Put away materials.

Observations

Record your observations in the table below. Give the table a title.

Title:

Test	Sample A	Sample B	Sample C	Sample D
Colour				
Odour				
Fehling's reagent				
Sudan IV				
Biuret reagent				
Silver nitrate				

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Reflecting on your observations

1. According to your observations, which test sample contains urea? Explain your answer.

_____

_____

2. According to your observations, which test sample contains blood cells?

_____

_____

3. Complete the table below by placing a checkmark in the appropriate boxes to define the composition of the test samples.

Test sample	Blood cells	Carbohydrates	Fats	Proteins	Minerals (chlorides)
A					
B					
C					
D					

4. Which test sample most closely resembles the urine of a healthy person?

_____

_____

_____

_____

_____

5. Blood cells are usually detected in the urine of a person with a urinary infection. Which test sample corresponds to a person with such an infection?

_____

_____

6. Diabetes mellitus is often detected by the presence of glucose in the urine. Which test sample could belong to a person with this disease?

_____

_____

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7. How could the test samples be improved to more closely resemble natural urine?

_____

_____

8. Do your observations help you to better understand the composition of urine? Explain your answer.

_____

_____

9. How could you improve the protocol for this lab?

_____

_____