Name: _____ Date: _____

Tests for Protein

Introduction

Protein is an important class of molecule needed in your daily diet because body cells are largely made of proteins. The antibodies that fight disease are proteins, as are hormones and enzymes that control reactions in your cells. The word "protein" comes from the Greek word "proteios", which means "of prime importance." Your cells and other proteins are built from the proteins you eat. These dietary proteins are broken down into amino acids during digestion of your food, which are then used to make body proteins.

We can find out if protein is present in our food by performing the *biuret test*. In a basic solution of NaOH, copper sulfate forms a purple complex with the chemical bond that holds the amino acids of proteins together. The chemical bond holding amino acids together is called the *amide bond* or *peptide bond*.

Materials

copper sulfate ($CuSO_4$) solution, 0.1%
food samples
pipettes
sodium hydroxide (NaOH) solution, 6 M

Equipment

stirring rod
test tubes

Safety Considerations

- **Sodium hydroxide at this concentration is extremely dangerous and caustic to the skin and eyes! You must wear goggles, gloves and a lab apron at all times.**
- Sometimes chemicals from previous labs still remain in glassware and on other lab equipment; wash all lab equipment before and after performing this lab.
- Wash your hands thoroughly after completing this lab.

Procedure

1. Separate egg white from an egg and dilute it by adding around 25 mL of distilled water.
2. Place 2 mL of diluted egg white in a clean test tube.
3. Add 4 full droppers (about 2 mL) of 6M NaOH solution. BE CAREFUL! Gently mix the solution with a stirring rod.
4. Add a few drops of 0.1% $CuSO_4$ solution to the test tube and mix thoroughly. Add a few more more drops of $CuSO_4$, up to about 10 drops, for a more intense color change.
5. When you have achieved a positive test for protein with the egg white sample, test the other available food samples for protein. Record your observations in the Data Table.

Clean-up

1. Dispose of any used food samples in the trash, NOT THE SINK.
2. Clean all used lab equipment with soap, water and a test tube brush.
3. Return all equipment to its proper location.
4. Wipe down your lab area and wash your hands before leaving the lab.

Data Table

Food Sample	Observations	Protein?
egg white		

Questions

1. Which of the food samples do you think has the greatest amount of protein? Why?

_____

_____

2. Besides the food samples used in this lab, what are two other sources of protein?

_____

_____

3. How do you think we could modify the biuret test used in this lab to figure out the amount of protein in each sample?

_____

_____

4. What do you think is more important, eating a diet high in protein or eating a diet high in carbohydrates? Why?

_____

_____

5. List one way you could change this lab and describe how your results might be different.

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