

Name _____

Section _____

Properties of Proteins

Experiment #8

Data & Report Sheet

Part A. Precipitation of Casein from Milk and Albumin from Egg White.

Record your observations regarding clumping of proteins and whether the clumps settle quickly to the bottom of the tube or remain suspended in the tube for a long time. You should also indicate whether the solution (especially egg white solution, which is clear to begin) becomes cloudy (i.e., small white aggregates) or whether there are large aggregates or clumps.

Vinegar	Mercuric Chloride	Lead Nitrate
Boiling Water Bath	Perchloric Acid	Alcohol

A-1. How do you explain any differences between the behavior of egg albumin and casein with respect to precipitation by vinegar and precipitation by heating in boiling water? Think about what happens when you place an egg in boiling water or when milk is heated.

Part B. Xanthoproteic Test for Aromatic Groups.

Record the color of the solution after heating with concentrated HNO_3 and then after making the solution alkaline with NaOH . Try to indicate differences in the shade or intensity of color.

Test Sample	Color with HNO_3	Change after adding NaOH
Egg White Soln		
Milk		
Tyrosine		
Tryptophan		
Glycine		

B-1. Explain why any of the test samples show no color changes.

Part C. Biuret Test.

Indicate the colors observed for each of the test solutions when Cu^{2+} is added.

Egg White Solution	Milk	Glycine

Name _____

Section _____

- C-1. Explain the differences in the color observed for each of the test solutions (recorded in the table above). What color is indicative of a positive biuret test? What color indicates a negative biuret test?

Part D. Millon's Test for Phenols.

Indicate the colors observed for each of the test solutions when Millon's reagent and sodium nitrite are added and whether there is any clumping or precipitation.

Glycine	Tyrosine	Egg White (with NH_4Cl)	Egg White (No NH_4Cl)	Milk

- D-1. Explain the observed colors in each of the amino acid or protein samples.

- D-2. Would you expect this test to be useful for the analysis of protein in urine? Explain why or why not.

Part E. Sulfur Test.

Record the observed changes in each solution after adding sodium hydroxide and lead nitrate to each sample.

Egg White Solution	Cysteine	Methionine

E-1. Although both cysteine and methionine contain sulfur, why would they react differently in this test?

E-2. Lead nitrate was used to denature proteins in part A and is used again here as a test for sulfur. What accounts for the difference in observations between the effects of lead in part A and in part E? Explain any similarities you may have observed (is there denaturation in both parts?) and any differences (are there differences in color?).

Some of the tests you have performed have been used in the past as tests for protein in urine. Why might a physician be interested in determining whether a patient has protein in the urine? What does protein in urine indicate?