

Group # \_\_\_\_\_

Name \_\_\_\_\_

Period \_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_

## **Ch 1 Lab • Safety – Acid in the Eye**

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**Lab Partners:** \_\_\_\_\_

### **Introduction**

This simple demonstration will teach your students the importance of wearing safety goggles any time heat, glassware or chemicals are used in a science laboratory. Show the immediate or irreversible destructive action of strong acids using egg whites as simulated eyes, and demonstrate the effectiveness of goggles for protecting the eyes.

### **Concepts**

- Goggle safety
- Reactivity of strong acids and bases

### **Materials**

Hydrochloric (HCl) or sulfuric acid, 6M

Sodium Hydroxide (NaOH)

DI water

raw eggs or egg whites

Dropper bottles or Pipets

Petri dish

### **Safety Precautions**

Hydrochloric, nitric, and sulfuric acids as well as sodium hydroxide are all highly toxic by ingestion or inhalation, and severely corrosive to skin and eyes. Wear chemical splash goggles and a chemical-resistant apron.

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### Procedures

1. Gently crack open an egg and separate the egg white from the egg yolk. Place the egg white in the Petri dish.
2. Discuss the similarities between an egg white and a human eye. Egg whites and human eyes contain an abundance of proteins. Proteins are neutral polymers (also called polypeptides) formed by linking amino acids together. Proteins, when subjected to strong acids, first undergo a process called denaturation, in which they lose their native three dimensional structures. The destruction of the proteins structure changes the properties of a protein and is frequently irreversible.
3. Using the dropper bottle of HCl, place several drops of acid on the egg white.
4. Try to “undo” the damage by gently rinsing the egg white with DI water.
5. Repeat the experiment again with a new egg. Place a clear overhead film paper over the eye to demonstrate what would happen if you wore contact lens.
6. Place several drops of acid on the egg white.
7. Use stir rod to gently move overhead film paper around to observe the effects of “rubbing your eye wearing contact lens”.
8. Repeat the experiment a 3<sup>rd</sup> time with a new egg. Using the dropper bottle of NaOH, place several drops of base on the egg white.
9. Try to “undo” the damage by gently rinsing the egg white with DI water.

### Disposal

- Egg shells in the trash.
- The egg whites should be rinsed with water and then disposed of in the sink
- Clean ALL equipment with soap, water, and brushes
- Dry all equipment with paper towels.
- Return all materials and supplies to their proper place, as directed by your teacher.
- Clean Lab BENCH with small soap bottle and sponge.
- Dry lab bench with paper towels.
- Wash hands with hand soap.
- Let me know when you are ready. **Do not get unprotected until dismissed.**

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### Data/Observations

Procedure	Observation
After adding Acid to egg whites	
After adding DI water to acid egg	
Contact lens on egg whites after adding acid	
After adding base (NaOH) to egg whites	

### Discussion

This demonstration should convince your students of the importance of wearing chemical splash goggles anytime chemicals, heat or glassware are used. During the school year, a gentle reminder of “remember the egg white” should bring back vivid memories of this safety demonstration and the importance of wearing goggles.

### Post-Lab Questions

1. What effect would getting acid in the eye have on your vision?
2. Which damaged the egg whites more after acid was added: with or without contact lens