

Name: _____ Date: _____ Period: _____

Lab: Endo or Exo

Background information: A chemical reaction occurs when two or more substances interact in a way that results in the formation of a new substance. A reaction is considered **endothermic** when heat energy is absorbed, resulting in a decrease in temperature. A reaction is considered **exothermic** when heat energy is released, resulting in an increase in temperature.

Objective: Investigate chemical reactions to determine whether they are endothermic or exothermic.

Safety Considerations: Goggles must be worn at all times during this experiment. All chemicals used are safe to pour down sink drain while water is running.

Reaction #1 Water + Epsom Salt

Hypothesis: If epsom salt is added to water, then the resulting reaction will cause the temperature to _____.

Procedures:

1. Pour 60mL of water into your cup.
2. Find and record the initial temperature of the water.
3. Add 2 teaspoons of epsom salt to the cup and stir with your temperature probe.
4. Record your observations.
5. Find and record the temperature 2 minutes after adding the epsom salt.
6. Clean out your cup and rinse off your temperature probe.

Materials:

1. Plastic cup
2. Temperature Probe
3. 60mL Water
4. 2 tsp Epsom Salt
5. Stopwatch

Data:	Before		After
Observations:	<u>Epsom Salt</u>	<u>Water</u>	
Temperature:			

Conclusion:

1. What happened to the temperature of the solution after combining the two substances?
2. Is this reaction endothermic or exothermic?

Reaction #2 Vinegar + Baking Soda

Hypothesis: If baking soda is added to vinegar, then the resulting reaction will cause the temperature to _____.

Procedures:

1. Pour 100mL of vinegar into your cup.
2. Find and record the initial temperature of the vinegar.
3. Add half a teaspoon of baking soda to the cup and stir with your temperature probe.
4. Record your observations.
5. Find and record the temperature 2 minutes after adding the baking soda.
6. Clean out your cup and rinse off your temperature probe.

Materials:

1. Plastic cup
2. Temperature Probe
3. 100mL Vinegar
4. $\frac{1}{2}$ tsp Baking Soda
5. Stopwatch

Data:	Before		After
Observations:	<u>Baking Soda</u>	<u>Vinegar</u>	
Temperature:			

Conclusion:

1. What happened to the temperature of the solution after combining the two substances?
2. Is this reaction endothermic or exothermic?

Reaction #3 Water + Calcium Chloride

Hypothesis: If calcium chloride is added to water, then the resulting reaction will cause the temperature to _____.

Procedures:

1. Pour 60mL of water into your cup.
2. Find and record the initial temperature of the water.
3. Add half a teaspoon of calcium chloride to the cup and stir with your temperature probe.
4. Record your observations.
5. Find and record the temperature 2 minutes after adding the calcium chloride.
6. Clean out your cup and rinse off your temperature probe.

Materials:

1. Plastic cup
2. Temperature Probe
3. 60mL Water
4. $\frac{1}{2}$ tsp Calcium Chloride
5. Stopwatch

Data:	Before		After
Observations:	<u>Calcium Chloride</u>	<u>Water</u>	
Temperature:			

Conclusion:

1. What happened to the temperature of the solution after combining the two substances?
2. Is this reaction endothermic or exothermic?

Reaction #4 Yeast + Hydrogen Peroxide

Hypothesis: If yeast is added to hydrogen peroxide, then the resulting reaction will cause the temperature to _____.

Procedures:

1. Pour 100mL of hydrogen peroxide into your cup.
2. Find and record the initial temperature of the hydrogen peroxide.
3. Add half a teaspoon of yeast to the cup and stir with your temperature probe.
4. Record your observations.
5. Find and record the temperature 2 minutes after adding the yeast.
6. Clean out your cup and rinse off your temperature probe.

Materials:

1. Plastic cup
2. Temperature Probe
3. 100mL Hydrogen Peroxide
4. ½ tsp Yeast
5. Stopwatch

Data:	Before		After
Observations:	<u>Yeast</u>	<u>Hydrogen Peroxide</u>	
Temperature:			

Conclusion:

1. What happened to the temperature of the solution after combining the two substances?
2. Is this reaction endothermic or exothermic?