**Endothermic and Exothermic Reactions Lab**

**Overview:**

Every chemical reaction that exists is one of two things: **endothermic** or **exothermic**. The Greek root “therm” means temperature or heat, which gives us a clue about all reactions: there is energy exchange! Endo means "within" while “exo” means "outside," so these types of reactions are opposite.

Endothermic reactions are those which absorb heat during the reaction. They take in more energy than they give off, which leaves the surroundings cooler than the starting point. Evaporation of water by sunlight is a great example. The sun and the liquid water combine, and the water absorbs energy and eventually becomes as gas.

Exothermic reactions are exactly the opposite. While they take some energy to get going, called the activation energy of reaction, these reactions give off heat during the reaction. Good examples of exothermic reactions are explosions like fireworks or combustion in engines.

**Problem:**

Observe endothermic and exothermic reactions and determine which absorbs or produce the most energy. Which reactions will be endothermic? Which reactions will be exothermic? Why?

### Materials

* Beakers
* Water
* White vinegar
* Baking Soda
* Hydrogen peroxide
* Dry yeast
* Thermometer

**Procedure**

1. Using your data sheet, you will need to locate the materials that will be used in each test.
2. For each test, insert the thermometer in the liquid and let it acclimate…. Once acclimated record the temperature in the “Initial temp” column on your data sheet.
3. Starting with Trial 1, add the corresponding dry material to the beaker. Record your observations.
4. Wait 1 minute and record the temp. Then wait another minute (total of 2 minutes) and record the final temperature of the solution.
5. Then move on to the next trial and repeat steps 1-4
6. For each trial, calculate the change in temperature of the reaction by subtracting the final value from the initial value.
7. State if the reaction was Endothermic or Exothermic on your data sheet.
8. Discard all of the liquid solutions into the sink.
9. **Wash** and **dry** glassware.
10. Place dried glassware by sink so that it is available for the next class.

**Please keep all Lab papers.**

**Data Sheet:**

**Trial #1 = Vinegar and Baking Soda Trial #1 Observations:**

|  |  |
| --- | --- |
| Hypothesis = |  |
|  |  |
| Initial temp. |  |
| 1 minute |  |
| 2 minutes |  |

Change in Temperature = \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Based on your data, this reaction was \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

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**Trial #2 = Peroxide and Yeast Trial #2 Observations:**

|  |  |
| --- | --- |
| Hypothesis = |  |
|  |  |
| Initial temp. |  |
| 1 minute |  |
| 2 minutes |  |

Change in Temperature = \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Based on your data, this reaction was \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.