

Name _____ Date _____ Period _____ Page _____

Energy Changes in Chemical Reactions - Notes Sheet

Key Concepts:

- ❖ If two substances react and the temperature of the mixture decreases, the reaction is _____.
- ❖ If two substances react and the temperature of the mixture increases, the reaction is _____.
- ❖ A chemical reaction involves the _____ in the _____ and the _____ in the _____.
- ❖ It takes _____ to break bonds.
- ❖ Energy is _____ when bonds are _____.
- ❖ If a reaction is endothermic, it takes _____ than is released when the bonds of the products are formed.
- ❖ If a reaction is exothermic, _____ than it takes to break the bonds of the reactants.

Energy Changes in Chemical Reactions.....Processing

Disposable hand warmers and self-inflating balloons use different chemical reactions to make them work. Both are packaged so that the reactants are kept separate. Once the consumer causes the reactants to combine, the chemical reactions begin.

Question to Investigate

How can endothermic and exothermic chemical reactions be useful?

Materials for Each Group

- Disposable self-heating hand warmer
- Self-inflating balloon

Procedure

1. Open the package the hand warmer is in to begin the chemical reaction.
2. Shake the hand warmer and feel for any temperature change.
3. Activate the self-inflating balloon by either pressing down or stepping on the packet of citric acid to rupture it.
4. Shake the balloon and feel the area on the balloon where the liquid is.
5. Be sure everyone in your group has a chance to feel both the hand-warmer and the self-inflating balloon.

1. Which is an example of an endothermic reaction?

Which is an example of an exothermic reaction?

2. For the hand warmer, what can you say about the amount of energy required to break bonds in the reactants compared to the amount of energy that is released when bonds are formed in the products?
3. For the self-inflating balloon, what can you say about the amount of energy required to break bonds in the reactants compared to the amount of energy that is released when bonds are formed in the products?