NAME _____ DUE DATE_____ PER___ MAIL BOX ____

SCI 7/8 LAB

ELEPHANT TOOTH PASTE ? "Say Whaaaa"

Lab Objective: activation energy, catalyst or catalase, endothermic and exothermic reactions, and the factors that effect rates of chemical reactions.

Word bank -
Activation energy **Catalyst** **Endothermic** **Exothermic** **Rates of chemical reactions**

_____ These are any substance that speeds up the rate of a chemical reaction. When found within the body of an organism, they speed up chemical reactions and are referred to as enzymes**.**

_____ This describes a chemical reaction or phase change that absorbs heat energy, typically as bonds are being formed between atoms.

_____ This term describes the energy needed to create effective collisions between molecules or atoms of reactants to sustain a chemical reaction.

_____ This describes a chemical reaction or phase change that releases heat energy, typically as bonds are being broken between atoms.

_____ Reactants can be made to be more reactive by grinding them into powders first to increase surface area, by increasing temperature or by adding a catalyst.

_____

Notes :

https://youtu.be/o4J9mLbvWJA - Lewis Dot Structures

Materials:
16oz bottle, funnel, tray, safety googles
Reactants - 1 teaspoon of yeast (activate in approximately 2 tablespoons of warm water)
½ cup of 6% hydrogen peroxide
Other - dawn dish soap (to capture oxygen bubbles)
Food color - (4 drops)

Procedure:

1. You must wear safety goggles.
2. Place bottle in an open mess safe zone, then add H_2O_2, dish soap and food coloring
3. Mix your yeast and water in a separate bottle
4. Add yeast (catalyst), stand back and observe the reaction

Record observations: what you see, smell, feel, notice, etc.

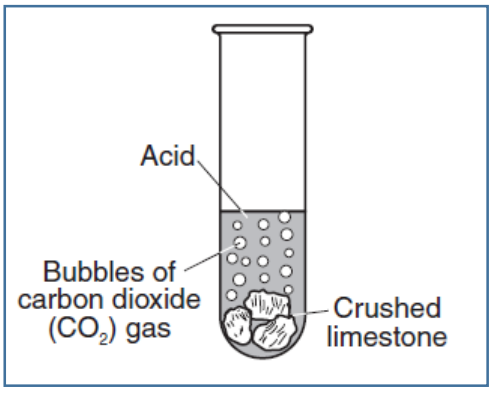
_____
_____
_____
_____

Complete lab concept comprehension questions:

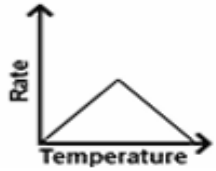
RATES OF CHEMICAL REACTIONS

1.____ In the adjacent test tube is crushed limestone submerged in HCl hydrochloric acid. If one of the products of this reaction is carbon dioxide, which of the following elements must be components of the compounds in limestone?

(a) Hydrogen and copper
(b) Mercury and lithium
(c) Carbon and oxygen
(d) Hydrogen and chlorine



2.____ Which graph shows the typical relationship between the temperature and rate of a chemical reaction?

A.


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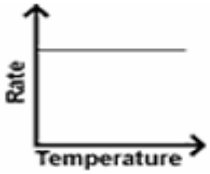

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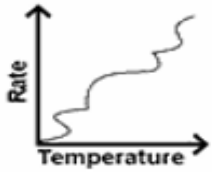

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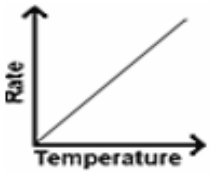
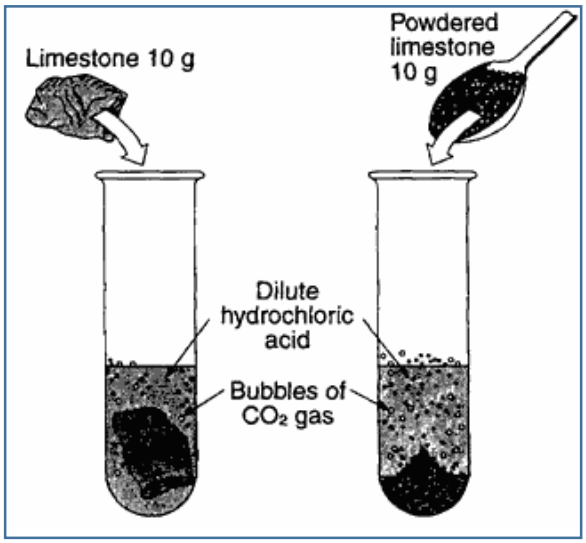


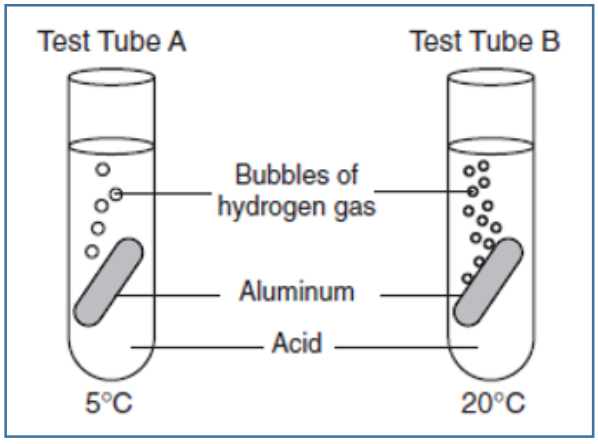
The demonstration shown in the diagram below indicates that powdered limestone reacts faster than a single large piece of limestone of equal mass when both are placed in acid.



3.____ In the adjacent experiment there are two test tubes with equal amounts of reactants. The most likely reason powdered limestone reacts faster is that it has _____.

(a) Less total volume
(b) more chemical potential energy
(c) more total surface area for the HCl to react with
(d) lower density

Equal sized pieces of aluminum were placed in test tubes containing equal volumes of acid, at different temperatures. The temperatures of the acid in test tube A is 5 degrees C. The temperatures of the acid in test tube B is 20 degrees C.



4.____ What effect will the temperature of the acid have on the rate of the chemical reaction in the test tubes?

(a) Little effect
(b) We can anticipate that the reaction will produce at a higher rate in Tube B
(c) Acid appears not to have an effect on aluminum
(d) The temperature will make the reaction endothermic

5.____What observation about the above image would indicate that there may be a chemical reaction occurring?

a) Different temperature of the test tubes
b) Bubbling due to gas formation
c) Aluminum sinking in the liquid
d) All of the above

6._____ Identify two ways that students could increase the rate of the reaction in either of the test tubes above. Circle all that apply.

a) Place the test tubes in a refrigerator
b) Place a Bunsen burner under the test tube
c) Pour the acid onto the aluminum
d) Grind up the aluminum first

ENDOTHERMIC / EXOTHERMIC

All chemical reactions involve a change in energy. Some chemical reactions give off this energy, others absorb it. This energy can be released in the form of heat, light, other types of radiation or mechanical energy (sound). The burning of a substance (combustion) is one common chemical reaction in which heat is being given off. This is referred to as an exothermic reaction. Chemical reactions that to the touch feel hot are exothermic. Chemical reactions that to the touch feel cold, are endothermic.

Other reactions to which the terms are applied although not chemical are phase changes. When liquid water turns to ice it is releasing heat energy and thus termed exothermic. Likewise when a substance undergoes the opposite phase change and goes from solid to liquid and then gas it is absorbing energy and is thus endothermic.

7.____ What type of chemical reaction absorbs energy and requires energy for the reaction to occur?
- (a) endothermic
- (b) exothermic
- (c) synthesis
- (d) both a and b

8.____ What type of reaction releases energy and does not require initial energy to occur?
- (a) endothermic
- (b) exothermic
- (c) decomposition
- (d) both a and b

9.____ An endothermic reaction is when _____
- (a) the system gains heat as the surroundings cool down.
- (b) the system loses heat as the surroundings heat up.
- (c) energy is neither created nor destroyed.
- (d) the reaction involves subatomic particles.

ACTIVATION ENERGY / CATALYSTS (CATALASE)

10. ____ A chemical reaction is usually started by providing the necessary _____.
- (a) endothermic energy
- (b) exothermic energy
- (c) activation energy
- (d) formation energy

11 ____ A catalyst can increase the rate of a reaction by
- (a) decreasing the activation energy
- (b) increasing the activation energy
- (c) decreasing the potential energy of the products
- (d) increasing the potential energy of the products

12. What was the catalyst in our classroom experiment? _____

WRITE YOUR MULTIPLE CHOICE RESPONSE HERE (for full credit)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

ANSWER SHEET