Name: Key Period: _____

Chapter 2 (Chemical Reactions) Study guide

Test: Wednesday 1/29/20

This guide is not the only thing you should use to study. It does not provide you with everything you need. You should also rely on your **Chemical Interactions** textbook, homework, and classroom notes. Use everything you can for the best results.

Topic 1: Observing Chemical Change – Textbook pg. 46-53; Binder pg 32-34

1. Explain the difference between chemical and physical properties.

Chemical Property	Physical Property
• Ability to change into another substance	• Characteristics that can be observed without changing into a new substance

2. State if the following examples are Chemical or Physical properties:
   a. Freezing Point of water — Physical
   b. Ability of water to rust — Chemical
   c. Shine of Aluminum — Physical
   d. Iron Melting — Physical

3. What are chemical reactions? When do chemical reactions occur? WHY?
   - A chemical reaction is a change in matter that produces one or more new substances.
   - Chemical reactions occur when bonds break and new bonds form because the atoms are sharing or transferring electrons

4. What are the 4 types of evidence that a chemical reaction has occurred?
   - Color Change
   - Gas Produced
   - Change in energy (ex/ Temperature Change)
   - Precipitate Forms (solid formed from 2 liquids)

5. When baking soda and vinegar are combined, gas bubbles form, the vinegar smell disappears, and the mixture gets colder. Has a chemical or physical change taken place? How do you know?
   Chemical Change; A new substance is formed; You know because a gas formed, odor, Temperature change

6. Compare and contrast *endothermic and exothermic reactions.* Give an example of each.
   Endothermic and exothermic reactions both are changes in energy. Endothermic absorb energy and Exothermic release energy

Topic 2: Describing Chemical Reactions – Textbook pg. 56-63; Binder pg. 35-40

7. What is the law of conservation of mass?
   Total mass of reactants equals total mass of products.

8. a) How would you expect the mass of a closed system at the end of a reaction to compare with the mass of the same system at the start of the reaction? Why?
   You would expect the mass to be the same because no matter can enter or leave the system
   b) How would you expect the mass of an open system at the end of a reaction to compare with the mass of the same system at the start of the reaction? Why?
   Mass of products would be less than mass of reactants because gases can escape.

9. You can balance a chemical equation by changing the coefficient.

10. **Label** the parts of the chemical equation below:
(subscript, formula, coefficient, reactant, product, yield)

$4Al + 3O_2 \rightarrow 2AlO$

coefficient, Formula, Subscript, Product

11. Balance the following equations. Then classify the reactions as synthesis, decomposition, single replacement, or double replacement You can use a separate sheet of paper to balance the equations!

a. $4Al + 3O_2 \longrightarrow 2Al_2O_3$ — Synthesis
(Al-4 O-6 → Al-4 O-6)

b. $2Al + 3NiBr_2 \longrightarrow 2AlBr_3 + 3Ni$ — Single Replacement
(Al-1 Ni-3 Br-6 → Al-2 Br-6 Ni-1)

c. $2N_2 + O_2 \longrightarrow 2N_2O$ — Synthesis
(N-4 O-2 → N-4 O-2)

d. $2NaCl \longrightarrow 2Na + Cl_2$ — Decomposition
(Na-2 Cl-2 → Na-2 Cl-2)

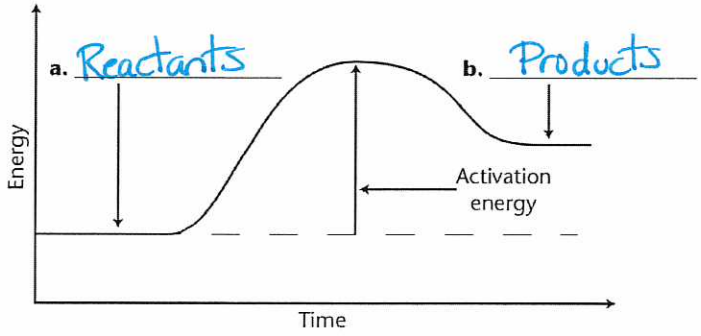
e. $3Li + AlCl_3 \longrightarrow 3LiCl + Al$ — Single Replacement
(Li-3 Al-1 Cl-3 → Li-3 Cl-3 Al-1)

Topic 3: Describing Chemical Reactions – Textbook pg. 66-71; Binder pg. 41-42

12. What is activation energy? The minimum amount of energy needed to start a reaction.

* All reactions require activation energy to start!

13. In the diagram, (a) Label the reactants and products on lines a and b in the figure above. (b) Is this reaction endothermic or exothermic? Explain your answer.



Endothermic require additional energy to keep going so energy of products is higher than energy of reactants.

14. What are the five factors that affect the rate of chemical reactions? **Give an example of each in real life.**

Factors	Examples
a. Surface Area	Digestion
b. Temperature	Putting food/milk in refrigerator to slow down spoiling
c. Concentration	Adding more antacid (medicine) increases reaction rate
d. Catalyst	Enzymes in our body
e. Inhibitors	Preservatives added to food

15. Explain the <u>difference</u> between a catalyst and an inhibitor.

Catalyst increases rate of reaction by lowering activation energy. (Inhibitors decrease reaction rates.)

16. How do enzymes in your body make chemical reactions occur at safe temperatures?

Enzymes lower activation energy so reactions can increase without raising body temperature

17. Why are inhibitors beneficial to the human body?

Decrease reaction rate by preventing reactants from coming together ex/ Spoiling Food

18. Which would have a faster reaction rate: a single sugar cube or an equal mass of sugar crystals? Explain.

Sugar crystals because more surface area so more particles of sugar are exposed than in a sugar cube.