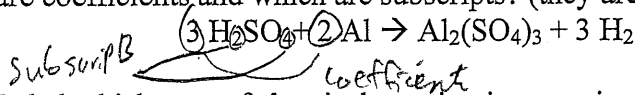


## Chemistry Test part 2 Study Guide Key

1. In a chemical reactions, **reactants** will break their chemical bonds in their original molecules. Then they will rearrange themselves and form new chemical bonds. The new bonding forms **products** at the end of the reaction. The **products** have different properties than the **reactants**.
2. Determine physical or chemical
  - a. P
  - b. P
  - c. C
  - d. P (chemical if it starts to react)
  - e. P
  - f. P
  - g. C
  - h. C (respiration is a chemical reaction in cells)
3. Evidence for chem. Reaction
  - a. Gas formation (bubbles, smoke)
  - b. Energy change (gets hotter or colder)
  - c. Precipitate (two liquids mixing that create a solid)
  - d. Light produced (like fireworks)
  - e. Sound produced (like a bang)
4. Law of Conservation of Mass – matter is not created or destroyed in chem. Reactions.
5. No more fuel to continue combustion that makes the engine run
6. Allows the two liquids to mix which then causes a light formation reaction.
7. The subscript indicates the ratio of elements that make up that molecule. Changing the subscripts would be like changing out the molecule altogether for a new, different substance.
8. There are still the same number of atoms of each element on both sides. The molecules that are on the product side are not as big as the original  $C_6H_{12}$  but the atoms just rearranged themselves into something different that still have the same number of atoms from the reactant side.
9. Equation is more for math and shows how to solve math problems, but chemical equations show how chemical reactions occur from beginning to end using symbols. The similarity is that numbers and values should equal on both sides so that matter is not being destroyed or created randomly.

- 10) Which numbers in the following balanced reaction of aluminum and sulfuric acid are coefficients and which are subscripts? (they are on reactant side)



- 11) Label which type of chemical reaction is occurring. (synthesis, decomposition, etc.)

- a.  $2Mg + O_2 \rightarrow 2MgO$  *syn.*  
b.  $HCl + NaOH \rightarrow H_2O + NaCl$  *double replacement*  
c.  $2NH_4NO_3 \rightarrow 2N_2 + O_2 + 4H_2O$  *decomp.*  
d.  $NaOH + AgNO_3 \rightarrow AgOH + NaNO_3$  *double replacement*

- 12) Balance the following reactions – be sure to copy them correctly into your problem set...

- a.  $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$   
b.  $2NaCl + Pb(NO_3)_2 \rightarrow 2NaNO_3 + PbCl_2$   
c.  $Ca + 2H_2O \rightarrow Ca(OH)_2 + H_2$   
d.  $Ca(HCO_3)_2 \rightarrow CaO + 2CO_2 + H_2O$   
e.  $6Cu + S_6 \rightarrow 6CuS$

- 13) Why is being able to name compounds correctly so important in chemistry?

*Otherwise you will misidentify compounds.*

- 14) List the diatomic elements – give their names and molecular formulas. (look it up, you'll see they are very familiar)

*H<sub>2</sub>, O<sub>2</sub>, He<sub>2</sub>, N<sub>2</sub>, Ne<sub>2</sub>, Ar<sub>2</sub>, Kr<sub>2</sub>, Xe<sub>2</sub>, Rn<sub>2</sub>*

### Multiple Choice Section

- 15) This law states the mass of reactants has to be equal to the mass of the products.

- a. The Law of Definite Proportions  
b. The Law of Multiple Proportions  
 c. The Law of Conservation of Mass  
d. The Law of Chemical Reactions

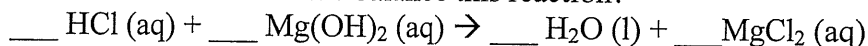
- 16) Which of the following is a chemical change?

- a. Pouring a glass of milk  
b. Adding chocolate syrup to the milk  
c. Stirring the chocolate syrup into the milk  
 d. Letting the milk sit out overnight and waking up to find sour milk

- 17) Which of the following is NOT a chemical change?

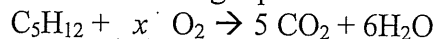
- a. Lighting a match  
b. Lighting a Bunsen Burner  
 c. Ice in a beaker over the Bunsen burner turn into water  
d. Adding pieces of calcium to the water in the beaker

18) What are the coefficients that will balance this reaction?



- a. 1, 2, 2, 1    **b. 2, 1, 2, 1**    c. 2, 2, 1, 1    d. 2, 1, 1, 2

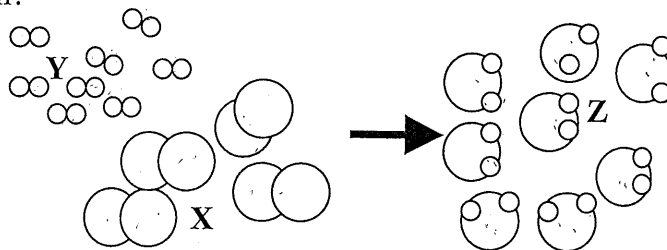
19) What is the "x" in the following equation?



- a. 4    b. 5.5    c. 16    **d. 8**    e. 10

20) According to the diagram on the right, which equation would correctly represent the reaction?

- a)  $8 \text{X} + 8 \text{Y} \rightarrow 8 \text{Z}$   
 b)  $8 \text{X} + 2 \text{Y} \rightarrow 8 \text{Z}$   
 c)  $8 \text{X} + 16 \text{Y} \rightarrow 24 \text{Z}$   
**d)  $\text{X} + 2 \text{Y} \rightarrow 2 \text{Z}$**   
 e)  $2 \text{X} + \text{Y} \rightarrow 3 \text{Z}$

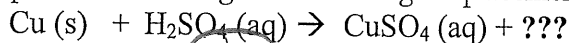


### Section 10-2: Classifying Chemical Reactions

21) Identify the Types of These Balanced Reactions (synthesis, decomp, etc.)

- a.  $\text{LiI} + \text{AgNO}_3 \rightarrow \text{LiNO}_3 + \text{AgI}$  *Double Rep.*  
 b.  $\text{Na} + \text{AgNO}_3 \rightarrow \text{NaNO}_3 + \text{Ag}$  *Single Rep.*  
 c.  $\text{H}_2\text{CO}_3 \rightarrow \text{H}_2\text{O} + \text{CO}_2$  *Decomp.*  
 d.  $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$  *Double Rep.*  
 e.  $\text{Na}_2\text{CO}_3 + \text{CaSO}_4 \rightarrow \text{Na}_2\text{SO}_4 + \text{CaCO}_3$  *Double Rep.*  
 f.  $4\text{H}_2\text{O} + 3\text{Fe} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$  *Single Rep.*  
 g.  $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$  *Synth.*  
 h.  $\text{CH}_4 + 2\text{O}_2 \rightarrow \text{CO}_2 + 2\text{H}_2\text{O}$  *Replacement*

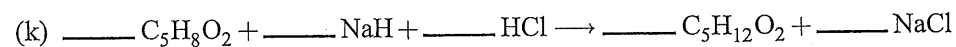
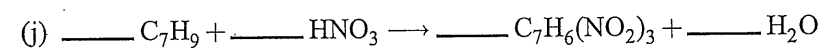
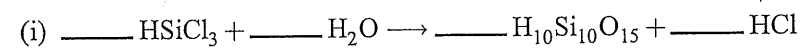
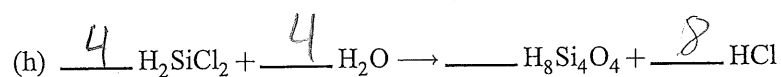
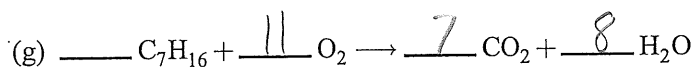
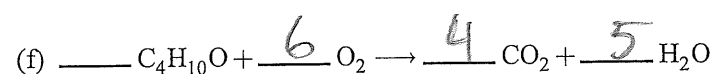
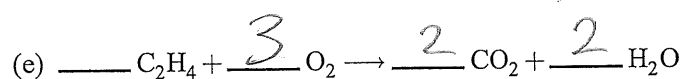
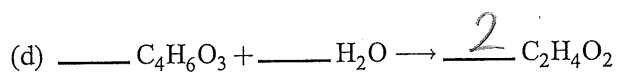
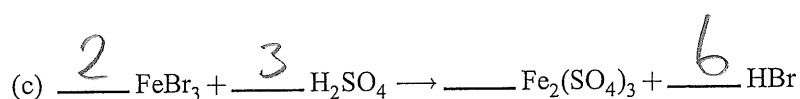
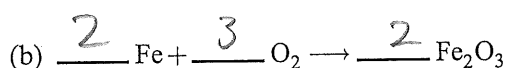
22) Which product is missing from this single replacement reaction?



- a. H (g)    **b. H<sub>2</sub> (g)**    c. CuO (s)    d. O<sub>2</sub> (g)    e. CO<sub>2</sub> (g)

## Balancing Equations: Practice Problems

1. Balance each of the following equations.



More  
jedi  
level,  
not on  
test

# Classifying and Balancing Equations

## Multiple Choice

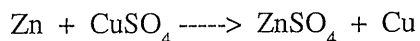
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### PRACTICE TEST

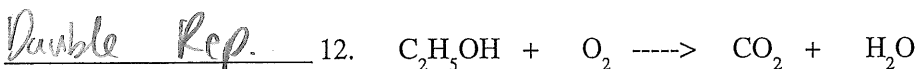
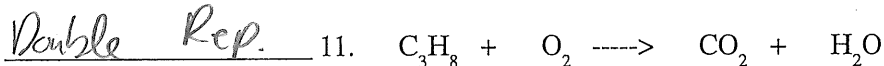
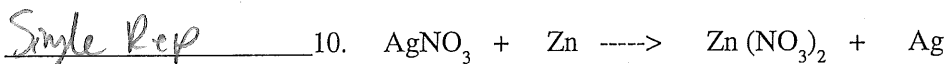
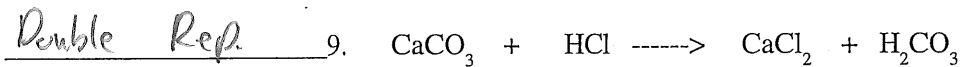
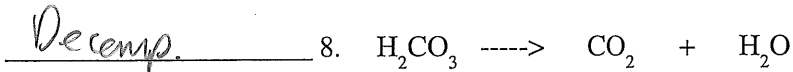
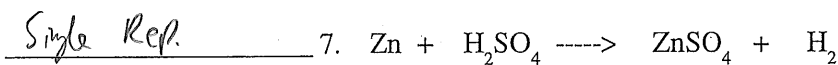
- \_\_\_\_\_ 1. A chemical reaction is a process in which  
 a. products change into reactants      c. substances can change state  
 b. the law of conservation of mass applies      d. all of these
- \_\_\_\_\_ 2. During a chemical reaction,  
 a. new elements are produced      c. atoms are destroyed  
 b. atoms are rearranged      d. elements are destroyed
- \_\_\_\_\_ 3. An equation is balanced by  
 a. changing subscripts      c. erasing elements as necessary  
 b. adding coefficients      d. adding elements as necessary
- \_\_\_\_\_ 4. An atom's ability to undergo chemical reactions is determined by its  
 a. protons      b. innermost electrons      c. neutrons      d. valence electrons
- \_\_\_\_\_ 5. What are the reactants in the following chemical equation:



- a. zinc and copper      c. zinc and copper (II) sulfate  
 b. zinc sulfate and copper      d. only zinc
- \_\_\_\_\_ 6. What are the products in the above equation?  
 a. zinc and copper      c. zinc and copper (II) sulfate  
 b. zinc sulfate and copper      d. only zinc

### Short Answer

For questions 7-12, classify the reaction according to the type it is. Put that answer in the blank. Then add coefficients to balance the reaction when necessary.



Write a balanced equation for each of the following reactions:

13. Magnesium chloride is the product of a reaction between magnesium and chlorine.

14. Copper (II) hydroxide and potassium sulfate are produced when potassium hydroxide reacts with copper (II) sulfate.

*Omit*

