CHEMICAL REACTIONS - GENERAL MULTIPLE CHOICE QUESTIONS

Answer Key

1. What is the missing coefficient in the equation

$$C_3H_8 + \underline{?}\,O_2 \text{ -------> } 3CO_2 + 4H_2O$$

A. 2
B. 3
C. 4
(D.) 5

2. The missing coefficient in the equation below is

$$Al_4C_3 + \underline{?}\,H_2O \text{ -------> } 4Al(OH)_3 + 3CH_4$$

A. 4
(B.) 12
C. 6
D. 24

3. Numbers placed in front of formulas in an equations are called
(A.) Coefficients
B. Subscripts
C. Products
D. Reactants

4. The symbol that indicates that a substance is dissolved in water is
A. (l)
(B.) (aq)
C. (H_2O)
D. (w)

5. Which of the following statements is true?
A. subscripts tell how many molecules are involved in a reaction
B. coefficients are used only in reactions which go to completion
(C.) subscripts tell how many atoms make up a molecule
D. coefficients can be fractional in a balanced equation

6. Which of the following reactions would not occur? (at room temp.)
A. $Na + FeS \text{ ---->}$
(B.) $Cu + SnCl_2 \text{ ---->}$
C. $Mg + AlCl_3 \text{ ---->}$
D. $Br_2 + NaI \text{ ---->}$

7. How would you describe the following reaction?

$$\text{energy} + 2Sb_{(s)} + 3I_{2(s)} \text{-------}\rightarrow 2SbI_{3(s)}$$

A. exothermic and synthesis
B. endothermic and synthesis
C. exothermic and double replacement
D. endothermic and neutralization replacement

8. For a chemical equation to be balanced

A. the sum of the reactant coefficients must equal the sum of the product coefficients
B. the reactants and products must show equal numbers of each kind of atom
C. the number of reactant molecules must equal the number of product molecules
D. the sum of reactant subscripts must equal the sum of product subscripts

9. In an exothermic reaction

A. the energy term is written on the reactant side of the equation
B. the sign of ΔH is positive
C. the bond energy of the reactants is greater than the bond energy of the products
D. non of the above choices are true

10. Given the following reaction

sulfuric acid + sodium hydroxide -----> sodium sulfate + ?

the missing compound would be

A. H_2O
B. SO_2
C. H_2S
D. NaHS

11. When aluminum chloride reacts with lead II nitrate, aluminum nitrate and lead II chloride are formed. Which equation properly represents this reaction

A. $AlCl_3 + 3PbNO_3 \text{-----}\rightarrow Al(NO_3)_3 + 3PbCl$
B. $2AlCl_3 + 3Pb(NO_3)_2 \text{-----}\rightarrow 2Al(NO_3)_3 + 3PbCl_2$
C. $AlCl_2 + Pb(NO_3)_2 \text{-----}\rightarrow Al(NO_3)_2 + PbCl_2$
D. $AlCl_3 + 3Pb(NO_3)_2 \text{-----}\rightarrow Al(NO_3)_3 + 3PbCl$

CHEMICAL EQUATIONS TEST

Name_____

1. Balance the following chemical equations: (1 mark each)

a) $2Rb + 2H_2O \longrightarrow 2RbOH + H_2$

b) $2H_2S + 3O_2 \longrightarrow 2H_2O + 2SO_2$

c) $CaO + 2HNO_3 \longrightarrow Ca(NO_3)_2 + H_2O$

d) $3NO_2 + H_2O \longrightarrow 2HNO3 + 1NO$

e) $2NH_4Cl + CaO \longrightarrow 2NH_3 + CaCl_2 + H_2O$

2. Convert the following word equations into balanced chemical equations. (3 marks each)

a) Calcium carbonate reacts with hydrochloric acid to produce calcium chloride, carbon dioxide and water.

$CaCO_3 + 2HCl \longrightarrow CaCl_2 + CO_2 + H_2O$

b) Aluminum reacts with copper II nitrate to produce aluminum nitrate and copper.

$2Al + 3Cu(NO_3)_2 \longrightarrow 2Al(NO_3)_3 + 3Cu$

c) Ammonia gas (NH_3) reacts with oxygen gas to produce nitrogen gas and water.

$4NH_3 + 3O_2 \longrightarrow 2N_2 + 6H_2O$

d) Calcium hydroxide reacts with hydrochloric acid to produce calcium chloride and water

$Ca(OH)_2 + 2HCl \longrightarrow CaCl_2 + 2H_2O$

e) Copper reacts with sulfuric acid to produce copper II sulfate, water and sulfur dioxide

$Cu + 2H_2SO_4 \longrightarrow CuSO_4 + 2H_2O + SO_2$

3. Identify each of the following reaction types (1 mark each)

a) $Cl_2 + 2KI \dashrightarrow 2KCl + I_2$

single repl.

b) $2H_2O_2 \dashrightarrow 2H_2O + O_2$

decomp.

c) $Fe + I_2 \dashrightarrow FeI_2$

synthesis

d) $2C_6H_6 + 15O_2 \dashrightarrow 12CO_2 + 6H_2O$

Combustion

e) $HNO_3 + KOH \dashrightarrow KNO_3 + H_2O$

Acid / Base.

f) $2AlCl_3 + 3Na_2CO_3 \dashrightarrow Al_2(CO_3)_3 + 6NaCl$

Double repl.

4. Complete and balance the following reactions. (3 marks each)

a) $2H_2O \dashrightarrow 2H_2 + O_2$

b) $CH_4 + 2O_2 \dashrightarrow CO_2 + 2H_2O$

c) $Al_2(SO_4)_3 + 3Ca(OH)_2 \dashrightarrow 2Al(OH)_3 + 3CaSO_4$

d) $2NaBr + Cl_2 \dashrightarrow 2NaCl + Br_2$

e) $Cu + 2AgNO_3 \dashrightarrow Cu(NO_3)_2 + 2Ag$

f) $H_2SO_4 + 2LiOH \dashrightarrow 2H_2O + Li_2SO_4$

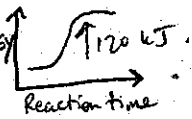
g) $Zn + 2NaBr \dashrightarrow$ no rxn. $ZnBr_2 + 2Na$

5. Rewrite the following equation using the energy term as part of the equation

$$N2 + 3H_2 \dashrightarrow 2NH_3 \quad \Delta H = +120\ kJ$$

$N_2 + 3H_2 + 120\ kJ \longrightarrow 2NH_3$

6. Is the reaction above exothermic or endothermic? endothermic

b) Draw the graph on next page: 

7. Predict the products of the following reactions (at room temp.). Balance the equation when required:

a) $2Al + 3SnO \longrightarrow Al_2O_3 + 3Sn$

b) $Cu + FeBr_3 \longrightarrow$ no rxn

c) $Cl_2 + 2HI \longrightarrow 2HCl + I_2$

d) $Ca(NO_3)_2 + Na \longrightarrow$ no rxn.

e) $NaF + Br_2 \longrightarrow$ no rxn.