Name _____ Chemistry ___/___/___

SOL Questions – Chapter 6

Each of the following questions below appeared on an SOL Chemistry Exam between 2000 and 2003. For each of the following circle the best answer.

1. Which of the following is a balanced equation?

a. $C_3H_8(g) + O_2(g) \rightarrow CO_2(g) + H_2O(g)$
b. $C_3H_8(g) + O_2(g) \rightarrow 3CO_2(g) + H_2O(g)$
c. $C_3H_8(g) + 2O_2(g) \rightarrow 3CO_2(g) + 4H_2O(g)$
d. $C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4H_2O(g)$

iron (III) chloride + sodium carbonate → iron (III) carbonate + sodium chloride

2. Which of these is the balanced equation for the reaction described above?

a. $FeCl_3 + Na_2CO_3 \rightarrow Fe_2(CO_3)_3 + NaCl$
b. $2FeCl_3 + 2Na_2CO_3 \rightarrow 3Fe_2(CO_3)_3 + 3NaCl$
c. $2FeCl_3 + 3Na_2CO_3 \rightarrow Fe_2(CO_3)_3 + 6NaCl$
d. $3FeCl_3 + 2Na_2CO_3 \rightarrow 3Fe_2(CO_3)_3 + 6NaCl$

3. Which of the following best represents the reaction between sulfuric acid and calcium hydroxide?

a. $H_2SO_4 + Ca(OH)_2 \rightarrow CaSO_4 + H_2O$
b. $HSO_4 + CaOH \rightarrow CaSO_4 + H_2O$
c. $H_2SO_4 + Ca(OH)_2 \rightarrow CaSO_4 + 2H_2O$
d. $H_2SO_4 + 2Ca(OH)_2 \rightarrow 2CaSO_4 + 3H_2O$

4. Which of the following reactions is a neutralization reaction?

a. $2AgNO_3 + Cu \rightarrow Cu(NO_3)_2 + 2Ag$
b. $KOH + HNO_3 \rightarrow KNO_3 + H_2O$
c. $C + O_2 \rightarrow CO_2$
d. $4Fe(OH)_2 + 2H_2O_2 \rightarrow 4Fe(OH)_3$

5. Which of the following reactions is an example of a single-replacement reaction?

a. $2AgNO_3 + Cu \rightarrow Cu(NO_3)_2 + 2Ag$
b. $NaOH + HCl \rightarrow NaCl + H_2O$
c. $CO_2 \rightarrow C + O_2$
d. $4Fe(OH)_2 + O_2 \rightarrow 4Fe(OH)_3$

6. Which of the following reactions is a decomposition reaction?

a. $S_8 + 8O_2 \rightarrow 8SO_2$
b. $O_2 + 2H2O \rightarrow 2H_2O_2$
c. $2KClO_3 \rightarrow 2KCl + 3O_2$
d. $2Na + 2AgCl \rightarrow 2NaCl + 2Ag$

7. Which of the following equations is balanced?

a. $H_2SO_4 + 2NaOH \rightarrow Na_2SO_4 + H_2O$
b. $CH_4 + Cl_2 \rightarrow CH_2Cl_2 + HCl$
c. $H_2O + MgO \rightarrow Mg(OH)_2$
d. $Al(OH)_3 + H_3PO_4 \rightarrow AlPO_4 + 2H_2O$

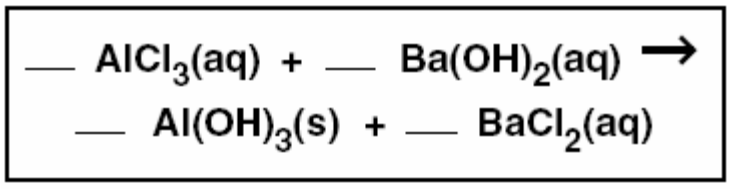
8. $Zn + CuSO_4 \rightarrow Cu + ZnSO_4$

Which reaction type *best* describes the reaction above?

a. Combination b. Decomposition c. Single replacement d. Combustion

9. Which of these reactions shows simple chemical decomposition?

a. $H_2 + I_2 \rightarrow 2HI$
b. $2NaCl \rightarrow 2Na + Cl_2$
c. $NaF + HCl \rightarrow HF + NaCl$
d. $I_2 + 2NaCl \rightarrow 2NaI + Cl_2$



10. When this equation is correctly balanced, the coefficient of the $AlCl_3$ will be —

a. 1 b. 2 c. 4 d. 6

$3MgO + 2Al \rightarrow ?$

11. What would be the product(s) of this reaction?
a. $2Mg_3Al_2O_3$ b. $Mg_3Al_2 + 3O_2$ c. $6Mg + Al_3O_2$ d. $3Mg + Al_2O_3$

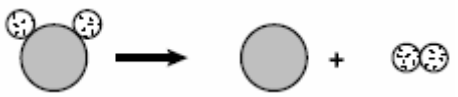
12. Which is an example of a synthesis reaction?
a. $HCl + KOH \rightarrow KCl + H_2O$
b. $Pb(NO_3)_2 + 2HBr \rightarrow PbBr_2 + 2HNO_3$
c. $C + O_2 \rightarrow CO_2$
d. $Mg + H_2SO_4 \rightarrow MgSO_4 + H_2$

13. Very Active Metal + Water → Metal Hydroxide + ?
Which of these completes this reaction?
a. Oxygen b. Hydrogen c. Metal oxide d. Air

$\_\_\_ H_2O \rightarrow \_\_\_ H_2 + \_\_\_ O_2$

14. The coefficients of the correctly balanced equation for the reaction illustrated above are —
a. 1, 1, 1 b. 1, 1, 2 c. 2, 1, 2 d. 2, 2, 1

15. $\_AgNO_3 + \_AlCl_3 \rightarrow \_AgCl + \_Al(NO_3)_3$
Which of these sets of coefficients will balance this equation?
a. 3, 3, 2, 1 b. 3, 1, 3, 1 c. 1, 6, 1, 9 d. 9, 3, 3, 3



16. What type of reaction does this illustration represent?
a. Decomposition b. Synthesis c. Single-replacement d. Double-replacement

$Fe + CuCl_2 \rightarrow FeCl_2 + Cu$

17. The type of reaction represented by the above equation is —
a. single-replacement b. double-replacement c. synthesis d. decomposition

18. A balanced chemical equation has equal numbers of atoms of each type on both sides of the equation. This illustrates the principle of —
a. conservation of energy b. conservation of mass c. action and reaction d. natural selection