Station - Balancing Equations and Activity Series

1. In which type of chemical reaction do two or more reactants combine to form one product, only?

   A) synthesis B) decomposition
   C) single replacement D) double replacement

2. Given the balanced equations representing two chemical reactions:

   $Cl_2 + 2NaBr \rightarrow 2NaCl + Br_2$
   $2NaCl \rightarrow 2Na + Cl_2$

   Which type of chemical reactions are represented by these equations?

   A) single replacement and decomposition
   B) single replacement and double replacement
   C) synthesis and decomposition
   D) synthesis and double replacement

3. Given the balanced equation representing a reaction:

   $$Zn(s) + H_2SO_4(aq) \rightarrow ZnSO_4(aq) + H_2(g)$$

   Which type of reaction is represented by this equation?

   A) decomposition B) double replacement
   C) single replacement D) synthesis

4. Which balanced equation represents a single-replacement reaction?

   A) $Mg + 2AgNO_3 \rightarrow Mg(NO_3)_2 + 2Ag$
   B) $2Mg + O_2 \rightarrow 2MgO$
   C) $MgCO_3 \rightarrow MgO + CO_2$
   D) $MgCl_2 + 2AgNO_3 \rightarrow 2AgCl + Mg(NO_3)_2$

5. Which equation represents a decomposition reaction?

   A) $CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$
   B) $Cu(s) + 2AgNO_3(aq) \rightarrow 2Ag(s) + Cu(NO_3)_2(aq)$
   C) $2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$
   D) $KOH(aq) + HCl(aq) \rightarrow KCl(aq) + H_2O(l)$

6. Given the balanced equation representing a reaction:

   $4Al(s) + 3O_2(g) \rightarrow 2Al_2O_3(s)$
   Which type of chemical reaction is represented by this equation?

   A) double replacement B) single replacement
   C) substitution D) synthesis

7. Given the balanced equation:

   $2KClO_3 \rightarrow 2KCl + 3O_2$
   Which type of reaction is represented by this equation?

   A) synthesis B) decomposition
   C) single replacement D) double replacement

8. Given the balanced equation:

   $AgNO_3(aq) + NaCl(aq) \rightarrow NaNO_3(aq) + AgCl(s)$

   This reaction is classified as

   A) synthesis B) decomposition
   C) single replacement D) double replacement

9. Given the reaction:

   $$Mg(s) + 2\ AgNO_3(aq) \rightarrow Mg(NO_3)_2(aq) + 2\ Ag(s)$$

   Which type of reaction is represented?

   A) single replacement B) double replacement
   C) synthesis D) decomposition

10. During all chemical reactions, mass, energy, and charge are

    A) absorbed B) conserved
    C) formed D) released

11. Which equation shows conservation of mass and charge?

    A) $NH_4Br \rightarrow NH_3 + Br_2$
    B) $2Mg + Fe^{3+} \rightarrow Mg^{2+} + 3Fe$
    C) $H_2SO_4 + LiOH \rightarrow Li_2SO_4 + H_2O$
    D) $Cu + 2Ag^{+} \rightarrow Cu^{2+} + 2Ag$

12. Given the unbalanced equation:

__Fe_2O_3 + __CO → __Fe + __CO_2

When the equation is correctly balanced using the *smallest* whole-number coefficients, what is the coefficient of CO?

A) 1 B) 2 C) 3 D) 4

13. Given the unbalanced equation:

__Al + __$CuSO_4$ → __$Al_2(SO_4)_3$ + __Cu

When the equation is balanced using the *smallest* whole-number coefficients, what is the coefficient of Al?

A) 1 B) 2 C) 3 D) 4

14. Given the unbalanced equation:

__$Mg(ClO_3)_2(s)$ → __$MgCl_2(s)$ + __$O_2(g)$

What is the coefficient of O_2 when the equation is balanced correctly using the *smallest* whole number coefficients?

A) 1 B) 2 C) 3 D) 4

15. Given the unbalanced equation:

__ Al(s) + __$O_2(g)$ → __$Al_2O_3(s)$

When this equation is correctly balanced using smallest whole numbers, what is the coefficient of $O_2(g)$?

A) 6 B) 2 C) 3 D) 4

16. Given the unbalanced equation:

__Na + __H_2O → __H_2 + __NaOH

When the equation is correctly balanced using the smallest whole-number coefficients, the coefficient for H_2O is

A) 1 B) 2 C) 3 D) 4

17. Given the balanced equation representing a reaction:
$C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4H_2O(g)$

What is the total number of moles of $O_2(g)$ required for the complete combustion of 1.5 moles of $C_3H_8(g)$?

A) .30 mol B) 1.5 mol
C) 4.5 mol D) 7.5 mol

18. Given the balanced equation representing a reaction:

$Mg(s) + Ni^{2+}(aq) \rightarrow Mg^{2+}(aq) + Ni(s)$

What is the total number of moles of electrons lost by Mg(s) when 2.0 moles of electrons are gained by $Ni^{2+}(aq)$?

A) 1.0 mol B) 2.0 mol
C) 3.0 mol D) 4.0 mol

19. Given the balanced equation representing a reaction:
$2CO(g) + O_2(g) \rightarrow 2CO_2(g)$
What is the mole ratio of CO(g) to $CO_2(g)$ in this reaction?

A) 1:1 B) 1:2 C) 2:1 D) 3:2

20. Given the balanced equation:

$CaCO_3(s) + 2HCl(aq) \rightarrow CaCl_2(aq) + H_2O(\ell) + CO_2(g)$

What is the total number of moles of CO_2 formed when 20. moles of HCl is completely consumed?

A) 5.0 mol B) 10. mol
C) 20. mol D) 40. mol

21. Given the balanced equation:

$2C + 3H_2 \rightarrow C_2H_6$

What is the total number of moles of C that must completely react to produce 2.0 moles of C_2H_6?

A) 1.0 mol B) 2.0 mol
C) 3.0 mol D) 4.0 mol