SCH4C

**Unit 1: Matter and Qualitative Analysis  
Test Review Part 2**

***Key Terms***

* Octet rule
* Law of Conservation of Mass
* Word equation
* Balanced chemical equation
* Reactants
* Products
* Synthesis reaction
* Decomposition reaction
* Single displacement reaction
* Double displacement
* Activity series
* Precipitation reaction
* Solubility
* Dissociation equation
* Total Ionic equation
* Net ionic equation
* Cation and anion

***Key Skills***

* *Draw Lewis structures (retest from previous test)*
* *Write word and chemical equations.*
* *Balance chemical equations.*
* *Class reactions as synthesis, Decomposition, Single Displacement or Double Displacement*
* *Use the activity series of metals and non-metals to compare reactivity*
* *Predict the products of a single displacement given these forms:*
* *Predict the solubility of various ionic compounds using the Solubility Rules*
* *Predict the product that will precipitate (if any) from a double displacement reaction*
* *Write TIE and NIE for a precipitation reaction*

***Review Questions:***

1. For each example, count the number of each type of atom present.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Ca3(PO4)2 | | 3 Al(OH)3 | | 2 (NH4)2SO4 | |
| Ca |  |  |  |  |  |
| P |  |  |  |  |  |
| O |  |  |  |  |  |
|  |  |  |  |  |  |

1. a) Thermite is a very reactive mixture of iron (III) oxide and powdered aluminum metal. When thermite reacts, it produces aluminum oxide and iron. Write a **word equation** for this reaction.

b) Write a **balanced chemical equation** for the reaction.

1. a) Aluminum oxide reacts with hydrochloric acid to form aluminum chloride and water. Write a **word equation** for this reaction.

b) Write a **balanced chemical equation** for the reaction.

1. Balance each chemical equation and state the type of reaction.
   1. NaNO3 (s) → NaNO2 (s)  + O2(g)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   2. Na2SO4(aq) + BaCl2(aq)  → NaCl(aq) + BaSO4(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   3. 8 Fe (s) + S8(g) → 8 FeS (s) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
   4. Zn(s) + AgCl(aq)  → ZnCl2(aq) + Ag(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Balance the following chemical equations. Use the simplest whole numbers possible.
3. \_\_\_\_HI + \_\_\_\_ H2SO4 → \_\_\_\_H2S + \_\_\_\_I2 + \_\_\_\_H2O
4. \_\_\_\_H2O2 → \_\_\_\_H2O + \_\_\_\_O2
5. \_\_\_\_Bi(ClO3)3 + \_\_\_\_ ZnSO4 → \_\_\_\_Zn(ClO3)2 + \_\_\_\_Bi2(SO4)3
6. \_\_\_\_NH3 + \_\_\_\_ O2 → \_\_\_\_N2 + \_\_\_\_H2O
7. \_\_\_\_\_ C5H12 + \_\_\_\_\_ O2 🡪 \_\_\_\_\_ CO2 + \_\_\_\_\_ H2O
8. You have just tested several metallic elements W, X, Y and Z. Use the following information to rank the new element in order from most reactive to least reactive.

i) Y vigorously with cold water

ii) W only reacts vigorously with acid

iii) X does not react with acid or water

iv) Z reacts very slowly with acid but not cold water.

Most reactive Least reactive

1. Use the activity series from the periodic table to predict if a reaction occurs. If no reaction occurs, write NR. If a reaction does occur, write the balanced chemical equation.

**Metal + acid salt + hydrogen**

Mg + H3PO4

Cu + HCl

**Metal + salt salt + metal**

Ag + LiNO3

Zn + Au(NO3)3

**Non-metal + salt salt + non-metal**

Cl2 + NaF

F2 + KBr

1. For each salt listed, indicate if it is soluble or insoluble.

a) Al2(SO4)3 d) NaOH g) (NH4)3PO4  
b) calcium bromide e) K2CO3 h) Au(NO3)3

c) lead (II) iodide f) barium hydroxide i) iron (III) phosphate

1. When salts (ionic compounds) dissolve, they produce positive ions (**cations**) and negative ions (called **anions**). For each of these soluble salts, write the corresponding dissociation equation. Be sure to show the correct ionic charges and balance each.

a) MgCl2

b) K3PO4

c) Fe(NO3)3

1. For the following double displacement reactions:

i) Identify the soluble (aq) and insoluble (precipitate, s) products with state symbols.  
ii) Write the total ionic equation (TIE)

iii) Write the net ionic equation (NIE)

a) **2**NaOH (aq)  + Be(NO3)2 (aq) Be(OH)2 (\_\_\_) +  **2**NaNO3 (\_\_\_)

TIE

NIE

b) Na2SO4 (aq)  + **2**AgNO3(aq)  **2**NaNO3(\_\_\_) + Ag2SO4 (\_\_\_)

TIE

NIE