Chemistry *Prac*Test: Chemical Equations

Check answers

1. Answer each question in the space provided. (12pts.)

a.) _____ In a chemical reaction the coefficients represent relative: (Moles / Masses)

b.) _____ Which are conserved in a chemical reaction? (Moles / Masses)

c.) _____ 10.0g of NaCl is decomposed. How many grams of Na are formed if 6.1g of Cl is produced?

d.) _____ How many atoms of O are indicated by 2 $Ba(OH)_2$?

e.) _____ According to appendix D, $Fe(OH)_3$ is listed as "*i*", what phase notation should it have?

f.) _____ According to appendix D, NH_4Cl is listed as "s", what phase notation should it have?

g.) _____ What phase notation should CO_2 have?

h.) _____ A sample of copper is dropped into a beaker of water. What phase notation should the Cu have?

i.) _____ $H_2O_{(s)} \rightarrow H_2O_{(l)}$, endothermic or exothermic?

j.) _____ $2\ SO_{2(g)} + O_{2(g)} \dashrightarrow 2\ SO_{3(g)}$, Name the product(s)

k.) _____ Which type of container is better to transport HCl, hydrochloric acid in? Zn metal, or glass?

l.) _____ In the reaction of NaCl with HCl, H2O is a reactant or product?

2. Balance and Classify the following equations as either Synthesis, Decomposition, Single Displacement, or Double Displacement. (10 pts.)

a.) _____ $Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2$

b.) _____ $BaCl_2 + NaOH \longrightarrow Ba(OH)_2 + NaCl$

c.) _____ $KClO_3 \longrightarrow KCl + O_2$

d.) _____ $PbCO_3 \longrightarrow PbO + CO_2$

e.) _____ $K_2O + H_2O \longrightarrow KOH$

3. Given the reactants, predict the products and write a balanced chemical equation for these reactions. (6 pts.)

a.) $K_2SO_4 + Pb(C_2H_3O_2)_2 \longrightarrow$

b.) $Fe(NO_3)_3 + Zn \longrightarrow$

c.) $Al + O_2 \longrightarrow$

4. Analyse the reaction below and answer each question in the space to the left. (7 pts.)

$$CuCl_{2(aq)} + K_2CO_{3(aq)} \longrightarrow 2\ KCl_{(aq)} + CuCO_{3(s)}$$

a.) _____ Classify as type of reaction. (i.e., syn., decomp., etc.)

b.) _____ Determine the charge on the copper reactant. ($^{+}1$, $^{+}2$, etc.)

c.) _____ Is the precipitate a reactant or product?

d.) _____ Name the precipitate.

e.) _____ Is potassium chloride soluble in water? (Yes or No)

f.) _____ How many atoms of carbon are represented on the reactant side?

g.) _____ If 5.00 grams of reactants was used, how many grams of products are formed?

5. Given the names of reactants, predict the products and write a balanced chemical equation for these reactions. (15 pts.)

a.) dichlorine monoxide

b.) nickel(III) chloride + zinc

c.) sodium + chlorine

d.) iron(II) nitrate + potassium hydroxide

e.) iron(III) oxide + aluminum

1. Below are three descriptions of chemical reactions, write a complete balanced chemical equation that includes phase notation.

(12 pts.)

a.) A piece of copper wire is added to a solution of silver nitrate.

b.) An electrical current is sent through 1200 ml of water. Bubbles are formed as the water decomposes.

c.) 1.5 g of copper(II) sulfate is added to a beaker and dissolved in water. In another beaker, 2.1 grams of barium chloride is dissolved into water. These two solutions are added together and a precipitate is formed. The precipitate is known to contain barium.

Answers

1. Answer each question in the space provided. (12pts.)

a) _**Moles**_____ In a chemical reaction the coefficients represent relative: (Moles / Masses)

b) _**Masses**_____ Which are conserved in a chemical reaction? (Moles / Masses)

c) _**3.9 g**_____ 10.0g of NaCl is decomposed. How many grams of Na are formed if 6.1g of Cl is produced?

d) _**4 atoms H**____ How many atoms of O are indicated by 2 $Ba(OH)_2$?

e) _**(s)**_____ According to appendix D, $Fe(OH)_3$ is listed as "*i*", what phase notation should it have?

f) _**(aq)**_____ According to appendix D, NH_4Cl is listed as "s", what phase notation should it have?

g) _**g**_____ What phase notation should CO_2 have?

h) _**s**_____ A sample of copper is dropped into a beaker of water. What phase notation should the Cu have?

i) __**endothermic**__ $H_2O_{(s)} \rightarrow H_2O_{(l)}$, endothermic or exothermic?

j) _**sulphur trioxide**_ 2 $SO_{2(g)}$ + $O_{2(g)}$ ---→ 2 $SO_{3(g)}$, Name the product(s)

k) __**glass**_____ Which type of container is better to transport HCl, hydrochloric acid in? Zn metal, or glass?

l) __**product**_____ In the reaction of NaCl with HCl, H2O is a reactant or product?

2. Balance and Classify the following equations as either Synthesis, Decomposition, Single Displacement, or Double Displacement. (10 pts.)

a.) _____single displacement____ $Zn + H_2SO_4 \longrightarrow ZnSO_4 + H_2$

b.) _____double displacement____ $BaCl_2 + 2NaOH \longrightarrow Ba(OH)_2 + 2NaCl$

c.) ___decompostition_____ $2KClO_3 \longrightarrow 2KCl + 3O_2$

d.) ___decompostion_____ $PbCO_3 \longrightarrow PbO + CO_2$

e.) ___synthesis_____ $K_2O + H_2O \longrightarrow 2KOH$

3. Given the reactants, predict the products and write a balanced chemical equation for these reactions. (6 pts.)

a.) $K_2SO_4 + Pb(C_2H_3O_2)_2 \longrightarrow$ **$2K(C_2H_3O_2) + PbSO_4$**

b.) $Fe(NO_3)_3 + 3Zn \longrightarrow$ **$Fe + 3Zn(NO_3)$**

c.) $4\ Al + 3\ O_2 \longrightarrow$ **$2\ Al_2O_3$**

4. Analyse the reaction below and answer each question in the space to the left. (7 pts.)

$CuCl_{2(aq)} + K_2CO_{3(aq)} \longrightarrow 2\ KCl_{(aq)} + CuCO_{3(s)}$

a) _____**Double displacement**_____ Classify as type of reaction. (i.e., syn., decomp., etc.)

b) _____**+2**_____ Determine the charge on the copper reactant. ($^{+}1$, $^{+}2$, etc.)

c) ____**product**_____ Is the precipitate a reactant or product?

d) _____**Copper(II) Carbonate**_____ Name the precipitate.

e) _____**Yes**_____ Is potassium chloride soluble in water? (Yes or No)

f) _____**1**_____ How many atoms of carbon are represented on the reactant side?

g) _____**5.00**_____ If 5.00 grams of reactants was used, how many grams of products are formed?

5. Given the names of reactants, predict the products and write a balanced chemical equation for these reactions. (15 pts.)

a.) dichlorine monoxide
$2\ Cl_2O \rightarrow 2\ Cl_2 + O_2$

b.) nickel(III) chloride + zinc
$NiCl_3 = Zn \rightarrow ZnCl_2 + Ni$

c.) sodium + chlorine
$2Na + Cl_2 \rightarrow 2Nacl$

d.) iron(II) nitrate + potassium hydroxide
$Fe(NO_3)_2 + 2KOH \rightarrow Fe(OH)_2 + 2KNO_3$

e.) iron(III) oxide + aluminum
$Fe_2O_3 + 2Al \rightarrow Al_2O_3 + 2Fe$

6. Below are three descriptions of chemical reactions, write a complete balanced chemical equation that includes phase notation.

(12 pts.)

a) A piece of copper wire is added to a solution of silver nitrate.

$$Cu_{(s)} + 2AgNO_{3(aq)} \rightarrow 2Ag(s) + Cu(NO_3)_{2\ (aq)}$$

b) An electrical current is sent through 1200 ml of water. Bubbles are formed as the water decomposes.

$$2H_2O_{\ (l)} \rightarrow 2H_{2\ (g)} + O_{2\ (g)}$$

c) 1.5g of copper(II) sulfate is added to a beaker and dissolved in water. In another beaker, 2.1 grams of barium chloride is dissolved into water. These two solutions are added together and a precipitate is formed. The precipitate is known to contain barium.

$$CuSO_{4(aq)} + BaCl_{2(g)} \rightarrow CuCl_{2\ (aq)} + BaSO_{4\ (s)}$$