Grade 11 Chemistry Review   SCH4U

1. SIGNIFICANT DIGITS

i) Determine the number of significant digits in each of the following:

a) 6.571 g   c) 2500 m   e) 30.07 g

b) 0.157 kg   d) 0.0700000 g   f) 0.106 cm

ii) Do the Following Calculations Using Scientific Notation and Using Correct Significant Figures:

g) 25.37 + 6.850 + 15.07 + 8.056 =   i) 3.15 x 2.5 x 4.00 =

h) 27.68 – 14.369 =   j) 40.8 / 5.05 =

2. STRUCTURE AND PROPERTIES OF MATTER

a) Calculate the number of protons, neutrons, and electrons for $^{213}_{82}Pb^{+4}$

b) Specifically explain the ranking of the following atoms from biggest to smallest atomic radius: Na, Mg, Ca

c) Specifically explain the ranking of the following atoms from biggest to smallest ionization energy: N, O, S
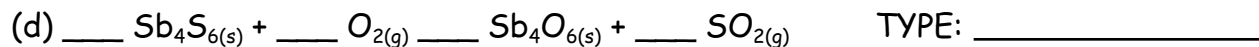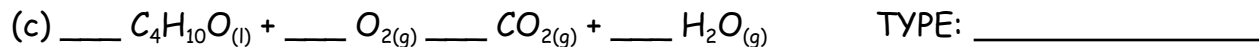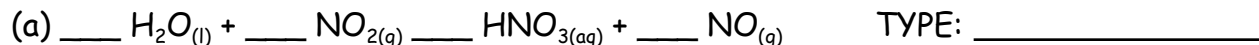
(REMEMBER to refer to Z_{eff} and n, energy level)

3. NAMING

Complete the following chart

Formula	Name	Formula	Name
a) He			i) fluorine gas
b) $AlBr_3$			j) sodium sulphide
c) CuO			k) copper(I)chloride
d) $Sr_3(PO_4)_2$			l) potassium dichromate
e) $FrNO_4$			m) nickel(III)hyposulphite
f) $HCl_{(aq)}$			n) stannous fluoride
g) $H_2SO_{4(aq)}$			o) sulphur hexabromide
h) $HClO_{(aq)}$			p) mercuric nitride

4. BALANCING AND TYPES OF REACTIONS

Balance and then identify each type of equation.

(a) ___ $H_2O_{(l)}$ + ___ $NO_{2(g)}$ ___ $HNO_{3(aq)}$ + ___ $NO_{(g)}$ TYPE: _____

(b) ___ $Fe_{(s)}$ + ___ $Cl_{2(g)}$ ___ $FeCl_{2(s)}$ TYPE: _____

(c) ___ $C_4H_{10}O_{(l)}$ + ___ $O_{2(g)}$ ___ $CO_{2(g)}$ + ___ $H_2O_{(g)}$ TYPE: _____

(d) ___ $Sb_4S_{6(s)}$ + ___ $O_{2(g)}$ ___ $Sb_4O_{6(s)}$ + ___ $SO_{2(g)}$ TYPE: _____

(e) ___ $Na_2CO_{3(aq)}$ + ___ $MgCl_{2(aq)}$ TYPE: _____

5. CHEMICAL QUANTITIES

(a) What mass of propane, $C_3H_{8(g)}$, reacting completely with excess oxygen, is required to produce 26.7 g of carbon dioxide gas?

(b) Examine the following reaction.
$$SrH_{2(s)} + 2H_2O_{(l)} \rightarrow Sr(OH)_{2(s)} + 2H_{2(g)}$$
i) When 2.50 g of SrH_2 is reacted with 8.03×10^{22} molecules of water, what is the limiting reagent?

ii) What mass of strontium hydroxide will be produced?

6. SOLUTIONS AND SOLUBILITY

(a) What is the molar concentration of the solution made by dissolving 1.00 g of solid sodium nitrate in enough water to make 315 mL of solution?
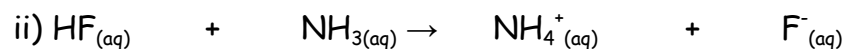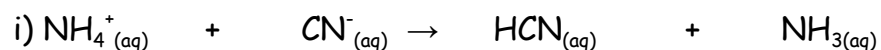
(b) By the addition of water, 80.0 mL of 4.00 mol/L sulfuric acid is diluted to 400.0 mL. What is the molar concentration of the sulfuric acid after dilution?

(c) Write the balanced molecular and net-ionic equations for the following reaction:

$$Na_3PO_{4(aq)} + Ca(OH)_{2(aq)} \; NaOH_{(aq)} + Ca_3(PO_4)_{2(s)}$$
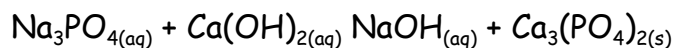
(d) In a titration, 50.0 mL of 0.0800 mol/L $NaOH_{(aq)}$ is titrated by a 0.0500 mol/L $H_3PO_{4(aq)}$ solution. What volume of $H_3PO_{4(aq)}$ must be added to neutralize the NaOH?

(e) For each of the following reactions identify the acid, base, conjugate-acid, conjugate-base

    i) $NH_4^+{}_{(aq)}$ + $CN^-{}_{(aq)}$ $\rightarrow$ $HCN_{(aq)}$ + $NH_{3(aq)}$

    ii) $HF_{(aq)}$ + $NH_{3(aq)}$ $\rightarrow$ $NH_4^+{}_{(aq)}$ + $F^-{}_{(aq)}$

7. GASES AND ATMOSPHERIC CHEMISTRY

    (a) One litre of a certain gas has a mass of 2.05 g at SATP. What is the molar mass of this gas?

    (b) When a spark ignites a mixture of hydrogen gas and oxygen gas, water vapour is formed. What mass of oxygen gas would be required to react completely with 1.00 g of hydrogen?