G10 Science: Class 2 Homework

1. Contrast the way in which the elements in ionic and covalent compounds achieve stability. **[2 mark]**

2. For each of the following compounds, classify the compound as ionic or covalent and name the compound. **[8 marks]**

Chemical Formula	Ionic/ Covalent	Chemical Name
SO_2		
PbO_2		
$AlCl_3$		
N_2O		
$KClO_3$		
SnO_2		
$FePO_4$		
N_2O_4		

3. Hydrogen peroxide H_2O_2 is a molecular compound used to disinfect cuts. Why is this formula of this compound not written as HO? **[2 marks]**

4. An unknown element X forms a compound with chlorine: XCl_2. Predict the chemical formula of the compound that element X makes with oxygen. Justify your answer. **[2 marks]**

5. Consider the following reaction: $AgNO_3(aq) + NaCl(aq) \rightarrow AgCl(s) + NaNO_3(aq)$

    a) Label the reactants and products in this reaction. **[2 marks]**

    b) Write the chemical name for the compounds that are dissolved in water. **[3 marks]**

    c) Write the chemical name for the precipitate. **[1 mark]**

6. Write the balanced chemical equation for the following: **[14 marks]**

    a) Potassium oxide + Water → Potassium hydroxide

    b) Aluminum + Oxygen → Aluminum oxide

    c) Silicon dioxide + Hydrogen fluoride → Silicon tetrafluoride + Water

    d) Tetraphosphorus + decoxide + Water → Hydrogen phosphate

    e) Nitrogen trihydride + Nitrogen monoxide → Nitrogen + Water

    f) Complete combustion of Pentane (C_5H_{12})

    g) Complete combustion of Diethyl ether ($C_4H_{10}O$)

7. Complete the following table. **[20 marks]**

Chemical Formula	**Chemical Name**
NaBr	
	Magnesium oxide
	Calcium carbonate
Li_2S	
$Be(OH)_2$	
	Lithium sulfate
CaO	
	Potassium iodide
	Boron trifluoride
PF_5	
CS_2	
	Chromium (III) nitride
FeO	
SnO_2	
	Nickel (II) fluoride
AgF	
	Beryllium chlorate
	Ammonium chloride
$Ca(NO_2)_2$	
H_2	

8. Balance the following chemical equations and classify the type of reaction. Write "syn" for synthesis, "dec" for decomposition, "SD" for single displacement and "DD" for double displacement. **[22 marks]** **Reaction Type**

a) _____ H_2 + _____ O_2 → _____ H_2O _____

b) _____ N_2 + _____ H_2 → _____ NH_3 _____

c) _____ S_8 + _____ O_2 → _____ SO_3 _____

d) _____ N_2 + _____ O_2 → _____ N_2O _____

e) _____ HgO → _____ Hg + _____ O_2 _____

f) _____ Zn + _____ HCl → _____ $ZnCl_2$ + _____ H_2 _____

g) _____ $SiCl_4$ + _____ H_2O → _____ H_4SiO_4 + _____ HCl _____

h) _____ Na + _____ H_2O → _____ $NaOH$ + _____ H_2 _____

i) _____ H_3PO_4 → _____ $H_4P_2O_7$ + _____ H_2O _____

j) _____ $C_{10}H_{16}$ + _____ Cl_2 → _____ C + _____ HCl _____

k) _____ CO_2 + _____ NH_3 → _____ $OC(NH_2)_2$ + _____ H_2O _____

l) _____ Si_2H_3 + _____ O_2 → _____ SiO_2 + _____ H_2O_3 _____

m) _____ $Al(OH)_3$ + _____ H_2SO_4 → _____ $Al_2(SO_4)_3$ + _____ H_2O _____

n) _____ Fe + _____ O_2 → _____ Fe_2O_3 _____

o) _____ $Fe_2(SO_4)_3$ + _____ KOH → _____ K_2SO_4 + _____ $Fe(OH)_3$ _____

p) _____ $CaSO_4$ + _____ KOH → _____ $Ca(OH)_2$ + _____ K_2SO_4 _____

q) _____ FeS_2 + _____ O_2 → _____ Fe_2O_3 + _____ SO_2 _____

r) _____ Al + _____ FeO → _____ Al_2O_3 + _____ Fe _____

s) _____ Fe_2O_3 + _____ H_2 → _____ Fe + _____ H_2O _____

t) _____ Fe + _____ H_2SO_4 → _____ H_2 + _____ $Fe_2(SO_4)_3$ _____

u) _____ Al_4C_3 + _____ H_2O → _____ CH_4 + _____ $Al(OH)_3$ _____

v) _____ Na + _____ O_2 → _____ Na_2O _____

9. Explain why you should not cook on a barbeque in an enclosed space. **[3 marks]**

10. Classify the following chemical equations as representing synthesis, decomposition, single displacement, double displacement, combustion reactions or neutralization. **[5 marks]**

_____ a) Ammonia + Sulfuric acid → Ammonium sulfate

_____ b) Aluminum + Copper(II) chloride → Aluminum chloride + Copper

_____ c) Phosphoric acid + Sodium hydroxide → Water + Sodium phosphate

_____ d) Aluminum sulfate → Aluminum oxide + Sulfur trioxide

_____ e) Ethane (C_2H_6) + Oxygen → Carbon dioxide + Water

11. Write a balanced chemical equation for the each of the reactions in Question (10). **[10 marks]**

a) _____

b) _____

c) _____

d) _____

e) _____