**COSTAATT**

**CHEM111 –Concepts in Chemistry I**

**Lesson 7 – Homework**

1. Balance the following equations, and then classify the reactions as synthesis, decomposition, single displacement, ionic precipitation, neutralisation or reversible reactions:

(a)**C12H22O11(s)→ C(s) + H2O(g)**

(b) **CaO(s) + H2O(l)→ Ca(OH)2(s)**

(c) **ZnBr2(aq) + AgNO3(aq) ----> Zn(NO3)2(aq) + AgBr(aq)**

(d) O2O3

(e) **Al(s) + CuCl2(aq)**→ **AlCl3(aq) +Cu(s)**

2. An example of a very reactive metal is:

(a) lead (b) potassium (c) iron (d) copper

3. When one metal takes the place of another it is called:

(a) precipitation (b) displacement (c) hydration (d) dissolving

4. (a) List the following metals in order of decreasing reactivity: aluminium, copper, iron, sodium.

(b) Some magnesium powder was mixed with some copper(II) oxide and heated strongly. There was a vigorous reaction, producing lots of sparks and a bright flash of light.

(i) Name the products of the reaction

(ii) Write a balanced symbol equation for the reaction

(iii) Write an ionic equation for the reaction

(iv) Classify the reaction as synthesis, decomposition, single displacement, ionic precipitation or neutralisation.

5. Study the following equations and, in each case, decide whether the substance in bold type has been oxidised or reduced. Explain your choice in terms of either oxygen transfer or electron transfer as appropriate.

(a) **Zn(s)** + CuO(s)ZnO(s) + Cu(s)

(b) **Fe2O3(s)** + 3C(s)2Fe(s) + 3CO(g)

(c) **Mg(s)** + Zn2+(s)Mg2+(s) + Zn(s)

(d) Zn(s) + **Cu2+(s)**Zn2+(s) + Cu(s)

6. Use oxidation numbers to determine if the following reactions are redox reactions. If they are redox reactions, give the reactant which has been oxidised and the reactant which has been reduced:

(a) 2KI(aq) + Cl2(g)2KCl(aq) + I2(aq)

(b) 2Fe(s) + 3Cl2(g)2FeCl3(s)

(c) FeCl2(aq) + (NH4)2S(aq)FeS(s) + 2NH4Cl(aq)

(d) BaCl2(aq) + H2SO4(aq) BaSO4(s) + 2HCl(aq)

7. In each of the following reactions give the reducing and the oxidising agents:

(a)2Fe2O3(s) + 3C(s)3CO2(g) + 4Fe(s)

(b) 2NO(g) + 2CO(g) N2(g) + 2CO2(g)

(c) Zn(s) + 2HCl(aq) ZnCl2(aq) + H2(g)

8. Some iron filings were shaken with some copper(II) sulphate solution. The ionic equation for the reaction is:

Fe(s) + Cu2+(aq)Fe2+(aq) + Cu(s)

1. Write down one change that you would observe during this reaction.
2. Which substance has been oxidised in this reaction?
3. Write down the full (not ionic) equation for this reaction.