ASSIGNMENT: CHEMICAL REACTIONS AND EQUATIONS

1. Write the balanced chemical equations for the following reactions and identify the type of reaction in each case.

(a) Thermit reaction, iron (III) oxide reacts with aluminium and gives molten iron and aluminium oxide.

(b) Magnesium ribbon is burnt in an atmosphere of nitrogen gas to form solid magnesium nitride.

(c) Chlorine gas is passed in an aqueous potassium iodide solution to form potassium chloride solution and solid iodine.

(d) Ethanol is burnt in air to form carbon dioxide, water and releases heat.

(e) Carbon disulphate burns in air to give carbon dioxide and sulphur dioxide.

2. A dilute ferrous sulphate solution was gradually added to the beaker containing acidified permanganate solution. The light purple colour of the solution fades and finally disappears. Which of the following is the correct explanation for the observation?

(a) $KMnO_4$ is an oxidising agent, it oxidises $FeSO_4$

(b) $FeSO_4$ acts as an oxidising agent and oxidises $KMnO_4$

(c) The colour disappears due to dilution; no reaction is involved

(d) $KMnO_4$ is an unstable compound and decomposes in presence of $FeSO_4$ to a colourless compound.

3. (a) Give one example of a chemical reaction.

(b) State two characteristics of the chemical reaction which takes place when dilute sulphuric acid is poured over zinc granules.

(c) Give two characteristics of the chemical reaction which occurs on adding potassium iodide solution to lead nitrate solution.

4. When the solution of substance X is added to a solution of potassium iodide, then a yellow solid separates out from the solution.

(a) What do you think substance X is likely to be?

(b) Name the substance which the yellow solid consists of.

(c) Which characteristic of chemical reactions is illustrated by this example?

(d) Write a balanced chemical equation for the reaction which takes place.

Mention the physical states of all the reactants and products involved in the chemical equation.

5. When water is added gradually to a white solid X, a hissing sound and a lot of heat is produced forming a product Y. A suspension of Y in water is applied to the walls of a house during white washing. A clear solution of Y is also used for testing carbon dioxide gas in the laboratory.

(a) What could be solid X? Write its chemical formula.

(b) What could be product Y? Write its chemical formula.

(c) What is the common name of the solution of Y which is used for testing carbon dioxide gas?

(d) Write chemical equation of the reaction which takes place on adding water to solid X.

(e) Which characteristics of chemical reactions are illustrated by this example?

6. When metal X is treated with a dilute acid Y, then a gas Z is evolved which burns readily by making a little explosion.

(a) Name any two metals which can behave like metal X.

(b) Name any two acids which can behave like acid Y.

(c) Name the gas Z.

(d) Is the gas Z lighter than or heavier than air?

(e) Is the reaction between metal X and dilute acid Y exothermic or endothermic?

(f) By taking a specific example of metal X and dilute acid Y,

Write a balanced chemical equation for the reaction which takes place.

Also indicate physical states of all the reactants and products.

7. A metal X forms a salt XSO_4. The salt XSO_4 forms a clear solution in water which reacts with sodium hydroxide solution to form a blue precipitate Y. Metal X is used in making electric wires and alloys like brass.

(a) What do you think metal X could be?

(b) Write the name, formula and colour of salt XSO_4.

(c) What is the blue precipitate Y?

(d) Write a chemical equation of the reaction which takes place

When salt XSO_4 reacts with sodium hydroxide solution.

Give the state symbols of all the reactants and products which occur in the above equation.

8. What are anti-oxidants? Why are they added to fat and oil containing foods?

9. (a) What is the colour of ferrous sulphate crystals? How does this colour change after heating?

(b) Name the product formed on strongly heating ferrous sulphate crystals. What type of chemical reaction occurs in this change?

10. Identify the oxidising agent (oxidant) in the following reactions

(a) $Pb3O4 + 8HCl \longrightarrow 3PbCl2 + Cl2 + 4H2O$

(b) $2Mg + O2 \longrightarrow 2MgO$

(c) $CuSO4 + Zn \longrightarrow Cu + ZnSO4$

(d) $V2O5 + 5Ca \longrightarrow 2V + 5CaO$

(e) $3Fe + 4H2\ O \longrightarrow Fe3\ O4 + 4H2$

(f) $CuO + H2 \longrightarrow Cu + H2O$