**SS 2 CHEMISSTRY**

***Lecture 3***

**Correction of previous assignment**

Using ‘***O.A’*** for oxidizing agent and ***‘R.A*** for reducing agent identify the reactants in the following equations of reaction.

1. 2 Mg(s)+ O2(g)  2MgO(s)
2. Al(s) + Zn2+(aq) Al3+(aq) + Zn(s)
3. Mg(s)+ Cl2(g)  Mg2+(aq) + 2Cl-(aq)
4. Cr2O2-(aq) + 14H+(aq) + 6Fe2+(aq) 2Cr3+(aq)

+ 6Fe3+(aq) + 7H2O(l)

1. 2MnO4-(aq) + 5SO2(g) + 2H2O(l) 2Mn2+(aq)

+ 5

Question number 5 was not complete. I had sent it before I discovered it; but I will complete it here and answer it.

1. O.A = O2 because O2 underwent reduction (0 to -2 oxidation state) so caused Mg to oxidize.

R.A = Mg because Mg underwent oxidation (0 to +2 oxidation state) so caused O2 to reduce.

1. O.A = Zn2+ (+2 to 0 oxidation state).

R.A = Al (0 to +3 oxidation state)

1. O.A = Cl2 (0 to -1 oxidation state)

R.A = Mg (0 to +2 oxidation state)

1. O.A = Cr2O2- (+6 of Cr to +3 of Cr)

R.A = Fe2+ (+2 to +3 oxidation state)

1. 2MnO4-(aq) + 5SO2(g) + 2H2O(l)

2Mn2+(aq) + 5SO42-(eq) + 4H+(eq)

O.A = MnO4- (+7 of Mn to +2 of Mn).

R.A = SO2 (+4 of S to +6 of S)

**Test for Oxidizing agents**

Let us remember that oxidizing agents needs reducing agents to react. So to test for oxidizing agents we need the reducing agents.

1. **Action on iron (ii) chloride:**

When a green solution of iron (ii) chloride, FeCl2, is added to an oxidizing agent, the iron (ii) ions donate an electron each to the oxidizing agent resulting it to be oxidized while the iron (ii) ions reduces to (iii) ions.

The observable change in the reaction is the change of green iron (ii) to brown colour iron (iii).



1. **Action on hydrogen sulphide**

When hydrogen sulphide, H2S, is passed through a solution of an oxidizing agent, yellow sulphur is deposited, due to the oxidation of the sulphide ions, S2-, by the oxidizing agent. During this process, each of the sulphide ions donates two electrons to the oxidizing agent (electron acceptor) to become atomic sulphur.



**Test for Reducing agents**

To test for reducing agents, we need oxidizing agents as the case of testing for the oxidizing agent, you need the educing agents.

1. **Action on potassium tetraoxomanganate (vii), KMnO4**

KMnO4 is a very powerful oxidizing agent. If acidified, it oxidizes all reducing agents by donating oxygen to the reducing agent.

When KMnO4 is introduced into a reducing agent, the purple colour of the KMnO4 will change to colourless. This is because Mn changes from +7 oxidation state which is purple in colour to +2 oxidation state which is colourless.



1. **Action on potassium heptaoxodichromate (vi), K2Cr2O7**

Another strong oxidizing agent is KCr3O7. The colour of Cr2O72- ion is orange. When any reducing agent is treated with acidified K2Cr2O7, the colour of K2Cr2O7 changes from orange to green. This is because of the change in orange colour of +6 oxidation state of Cr to green colour of +3 oxidation state.

