Corrosio eei assignment

This assignment entailed the task of investigation into the a) Conditions under which corrosion is accelerated, and b) Methods of preventing corrosion. Two experiments were implemented to answer these questions and hence reach a definate conclusion. First off let’s look at the background of corrosion and the way in which it occurs. The first hypothesis to answer was, ‘ What affect does water temperature have on the rate of corrosion of iron in sea water? ‘ The assumed answer was that ‘ As temperature decreases, the rate of corrosion will decrease. Secondly, ‘ Which sacraficial anode would protect and shield the Iron, resulting in a decrease in corrosion levels, within salt water? ‘ The hypothesised answer was that the more active a metal then iron is , the greater protection it would provide. ‘ Corrosion is a redox reaction where metals become worn and disintegrated, resulting in the inability of further use. A redox reaction involves the transfer of electrons from one element to another, whereby the element which loses electrons is the reductant and the element which gains electrons is the oxidant.

The rusting of iron(hydrated iron(111) oxide) is an example of corrosion, which is under gone everyday. The rusting of iron is an electrochemical process,. This process involves a number of steps, starting with the oxidation of the Iron. Fe(s) > Fe2+(aq) = 2e- Oxygen is then dissolved in the water resulting in the element losing electrons to become the reductant. O2(aq) + 2H2O(l) + 4e- > 4OH-(aq) From these two reactions an iron(11) hydroxide solution is created and then precipitated. Fe2+(aq) + 2OH-(aq) > Fe(OH)2(S)

This solution is then oxidised, hence forming the hydrated iron(3) oxide or rust. 4Fe(s) + 302(aq) + 2H20(l) > 2Fe2O3. H2O(s) = Fe2O3. xH2O – X is

commonly 1 or 2. Electrolytes in sea water help by increasing conductivity of the water, providing a path between the anode and cathodes. When Iron is oxidised, areas of the Iron which are exposed to oxygen become the cathodic site, and are hence protected from corrosion. The opposite effect of oxygen causes the other areas of the Iron to become a anodic site, and hence corrosion occurs. The problem with corrosion