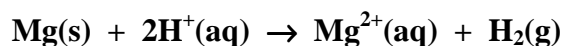
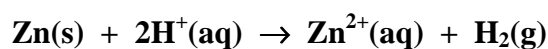
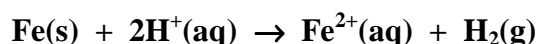


**Marks**  
**4**

- Five strips of different metals were immersed in five different containers with concentrated HCl and the following observations were made.
  1. In the container with the strip of Cu, no change was observed.
  2. In the container with the strip of Sn, no change was observed.
  3. In the container with the strip of Fe, a yellow colour slowly emerged after immersion.
  4. From the container with the strip of Zn, gas started to bubble out.
  5. In the container with the strip of Mg, a vigorous reaction was observed and soon the strip disappeared.

Write down the reactions involved, if any occur.



Explain these experimental observations.

**Cu does not react as the oxidation potential for Cu is negative.**

**Sn would be expected to react as it has a slightly positive oxidation potential. The fact that it does not is due to a high overpotential for the formation of H<sub>2</sub> gas.**

**All the other metals react, evolving H<sub>2</sub>(g) as expected. The higher the oxidation potential (Mg > Zn > Fe), the more vigorous the reaction.**

Explain how cathodic protection can prevent the corrosion of iron.

**Fe, when placed in contact with another metal with a higher oxidation potential (e.g. Zn, Mg) will act as the cathode. The other metal will act as the sacrificial anode and will be oxidised preferentially.**