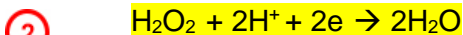
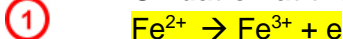


Electrochemical Cell**Reduction at the cathode:**

The solution remains colourless as H_2O_2 and H_2O are both colourless.

This is a reduction reaction as the oxidation number of O decreases from -1 in H_2O_2 to -2 in H_2O . A decrease in oxidation number corresponds to reduction.

Each H_2O_2 gains two electrons. Gaining of electrons corresponds to reduction.

Oxidation at the anode:

The solution turns from pale green Fe^{2+} to orange Fe^{3+} .

This is an oxidation reaction as the oxidation number of Fe increases from +2 in Fe^{2+} to +3 in Fe^{3+} . An increase in oxidation number corresponds to oxidation.

Each Fe^{2+} loses 1 electron, losing electrons corresponds to oxidation.

 E°

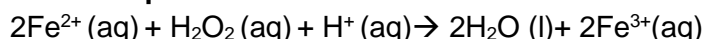
An electrochemical cell is an apparatus that uses a spontaneous oxidation-reduction reaction to produce an electric current. It consists of two half cells connected by a conducting wire and a salt bridge. The reaction is spontaneous creating electrical energy.

For this reaction:

③ $E^\circ_{\text{cell}} = E^\circ_{\text{red}} - E^\circ_{\text{ox}} = +1.77 \text{ V} - 0.77 \text{ V} = +1.00 \text{ V}$

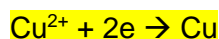
④ As E°_{cell} is positive, the reaction is spontaneous.

The most positive E° value will be the reduction reaction as these are reduction potentials

Overall equation:**Electrolytic cell**

From observations: The electrolysis of molten copper oxide produces bubbles of a colourless gas at one electrode and an orange solid is deposited at the other electrode.

⑤ Colourless gas is oxygen at the positive anode. Orange solid is copper and it is deposited at the negative cathode.

Reduction at the cathode (negative electrode)

② The oxidation number of Cu decreases from +2 in Cu^{2+} to 0 in Cu.

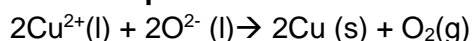
Each Cu^{2+} gains 2 electrons.

Oxidation at the anode (positive electrode)

The bubbles of colourless gas are oxygen.

The oxidation number of O increases from -2 in O^{2-} to 0 in O_2 .

Each O^{2-} loses 2 electrons.

Overall equation**Energy requirements**

The battery provides push for electrons to move in the reverse direction to their natural tendency. The non-spontaneous reaction is forced to occur and electrical energy is consumed in order to produce a chemical reaction.