This results in hydrogen gas forming at the cathode and oxygen gas at the anode.

Faraday's First Law of Electrolysis

Faraday's first law of electrolysis states that "The mass (M) of an element discharged during electrolysis is directly proportional to the quantity (Q), passing through it".

Recall, quantity of electricity (Q) is derived from the rate flow of electricity.

I.e. $Q = it$

$M \alpha Q$

$M \alpha it$

$M = zit$

Where z = Electrochemical equivalent.

Faraday's Second Law of Electrolysis

Faraday's second law of electrolysis states that "When the same quantity of electricity is passed through different electrolytes, the exact number of moles of elements discharged are inversely proportional to the charges on the ions of the element".

The minimum quantity of electricity required to liberate one mole of singly-charged ions, like hydrogen or chloride ions is 96500 coulombs (C)". This quantity of electricity is called the **Faraday** denoted by F.

$M^+ + e^- \rightarrow M$

$A^- \rightarrow A + e^-$

1 Faraday = 1 mole of electron

Recall that one (1) mole of electron contains Avogadro's Constant (6.02×10^{23})

Uses of Electrolysis

1. Purification of metals (e.g. u, Ag, Hg, Au).
2. Electroplating of one metal by another.
3. Extraction of Elements.
4. Preparation of certain important compounds, such as sodium hydroxide and sodium trioxocarbonate (v).

You are to answer these questions on your own.