ELECTROCHEMICAL CELLS

Primary and Secondary Cells
ELECTROCHEMICAL CELLS

- Yes write the following down in your notes...
- Electrochemical Cells
- There are two types of Electrochemical cells
  1) Primary (disposable)
  2) Secondary (rechargeable)
- In secondary cells two reactions can occur, one discharges the cell and another occurs when the cell is recharged
In a primary cell, chemical reactions use up some of the materials in the cell as electrons flow from the cell.

When the materials have been used up the cell is said to be discharged and can not be recharged.

There are two basic types of primary cells:

- The primary wet cell and...
- The primary dry cell
The wet cell, also known as a voltaic cell, was invented in 1800 by Volta.
The voltaic cell is called a wet cell because it is made of two pieces of metal (e.g. magnesium and copper) that are placed in a liquid (e.g. hydrochloric acid).

The metal pieces are called electrodes, while the liquid is called an electrolyte.

The magnesium electrode reacts with the acid, and the energy released separates electrons from the magnesium atoms. These electrons collect on the magnesium electrode (negative terminal).
At the same time, positive charges collect on the copper plate (the positive terminal).

Current only flows when connected to a circuit.

Disadvantages:

- Danger of spilling electrolyte (acid)
- Continual need to replace zinc plate and acid (consumed)
The wet cell (voltaic cell) (take notes)

- The wet cell (voltaic cell)
- Consists of two metal electrodes (magnesium and copper) placed in a solution known as an electrolyte (usually an acid, e.g. HCl)
- The magnesium (Mg) reacts with the acid releasing energy that separates the electrons from the magnesium atoms (the negative terminal)
- Positive charges build up on the copper (the positive terminal)
THE WET CELL (VOLTAIC CELL) (TAKE NOTES)

- The chemical reaction and build up of electrons give the electrons energy
- For every electron that leaves the negative terminal of the circuit, another electron must move out of the circuit and onto the positive terminal
- Electrons release their energy (voltage) to the load
Simple voltaic cell

Reduction (GER)

Oxidation (LEO)

Copper (cathode +)

Magnesium (anode -)

Dilute hydrochloric acid (electrolyte)
The electrolyte in dry cells is not a liquid as in wet cells but rather a paste so dry cells are not exactly dry.
Secondary cells are also known as rechargeable batteries and have a second recharging chemical reaction in addition to the discharging reaction.