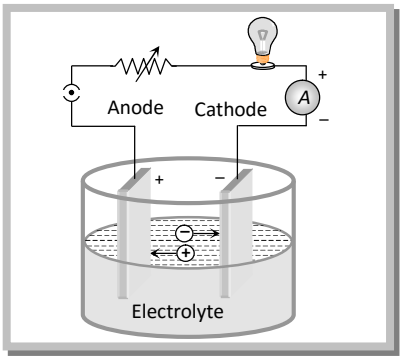
Cell.

The device which converts chemical energy into electrical energy is known as electric cell.



(1) A cell neither creates nor destroys charge but maintains the flow of charge present at various parts of the circuit by supplying energy needed for their organized motion.

(2) Cell is a source of constant emf but not constant current.

(3) Mainly cells are of two types:

(i) Primary cell: Cannot be recharged

(ii) Secondary cell: Can be recharged

(4) The direction of flow of current inside the cell is from negative to positive electrode while outside the cell is form positive to negative electrode.

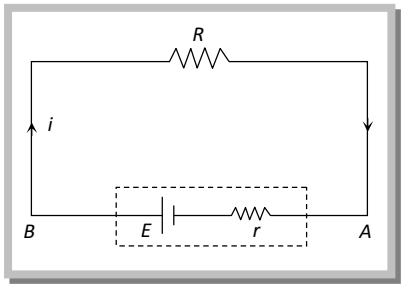
(5) A cell is said to be ideal, if it has zero internal resistance.

(6) Emf of cell (E): The energy given by the cell in the flow of unit charge in the whole circuit (including the cell) is called its electromotive force (emf) i.e. emf of cell $E = \frac{W}{q}$, its unit is volt

or

The potential difference across the terminals of a cell when it is not given any current is called its emf.

(7) Potential difference (V): The energy given by the cell in the flow of unit charge in a specific part of electrical circuit (external part) is called potential difference. Its unit is also volt



or

The voltage across the terminals of a cell when it is supplying current to external resistance is called potential difference or terminal voltage. Potential difference is equal to the product of current and resistance of that given part i.e. V = iR.

(8) Internal resistance (r): In case of a cell the opposition of electrolyte to the flow of current through it is called internal resistance of the cell. The internal resistance of a cell depends on the distance between electrodes ($r \propto d$), area of electrodes [$r \propto (1/A)$] and nature, concentration ($r \propto C$) and temperature of electrolyte [$r \propto (1/\text{temp.})$]. Internal resistance is different for different types of cells and even for a given type of cell it varies from to cell.