

7. Since there is no corrosion of zinc, the life of alkaline battery will be longer.

8. Its output capacity is high.

Secondary batteries or storage batteries or Accumulators:-

Introduction:-

The storage battery, secondary battery or charge accumulator is a cell or combination of cells in which the cell reactions are reversible. This means that the original chemical conditions within the cell can be restored by passing current to flow into it i.e. by charging from an external source. The term "accumulator" is used as it accumulates and stores energy through a reversible electrochemical reaction. Rechargeable batteries are produced in many different shapes and sizes, ranging from button cells to megawatt systems connected to stabilize an electrical distribution network.

Lead-Acid Accumulator or Acid Battery:-

A storage cell is one which can operate both as a voltaic cell and as an electrolytic cell. When it acts as a voltaic cell it supplies electrical energy. On recharging it acts as an electrolytic cell.

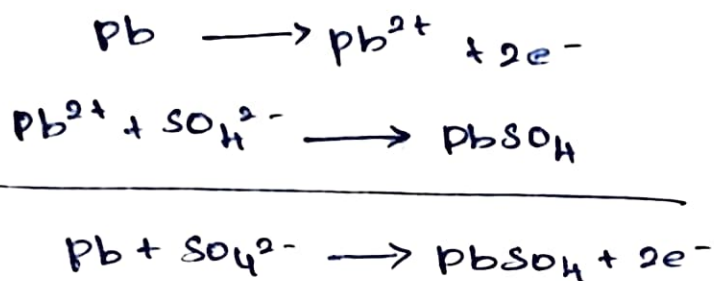
An acid battery consists of a negative electrode

of porous lead (lead sponge) as the anode and a positive electrode of lead dioxide as the cathode. A number of such electrode pairs are immersed in an aqueous solution of 20% sulphuric acid (specific gravity 1.15 at 25°C) which is the electrolyte.

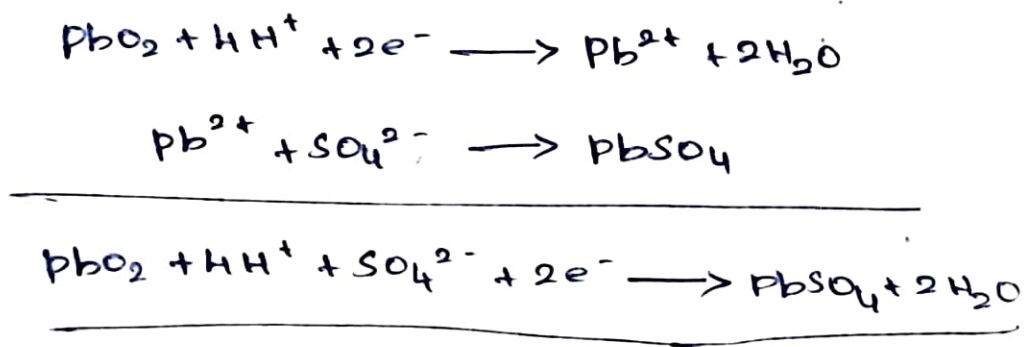
Discharging:-

The electrode reactions that occur during the discharge of the cell, i.e. when current is drawn from the cell are as follows:

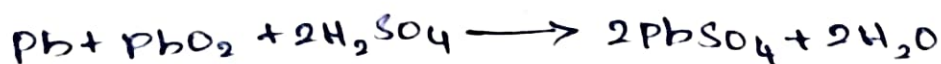
Anode



Cathode



The overall cell reaction is as follows:

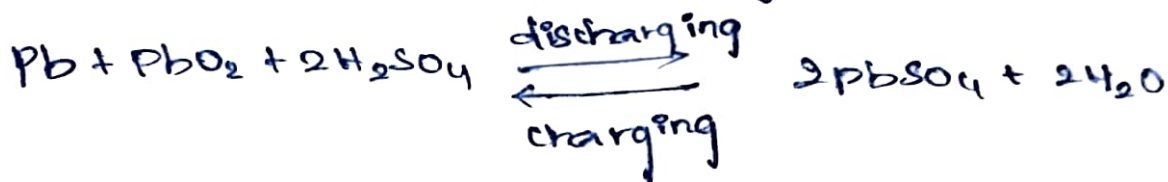


The PbSO_4 formed gets precipitated on the cathode and in the solution.

charging:-

When both anode and cathode become covered with $PbSO_4$, the cell stops its functioning. Recharging is done by applying a voltage across the electrodes that is slightly higher than the voltage that the battery can deliver.

The net reaction during discharging is

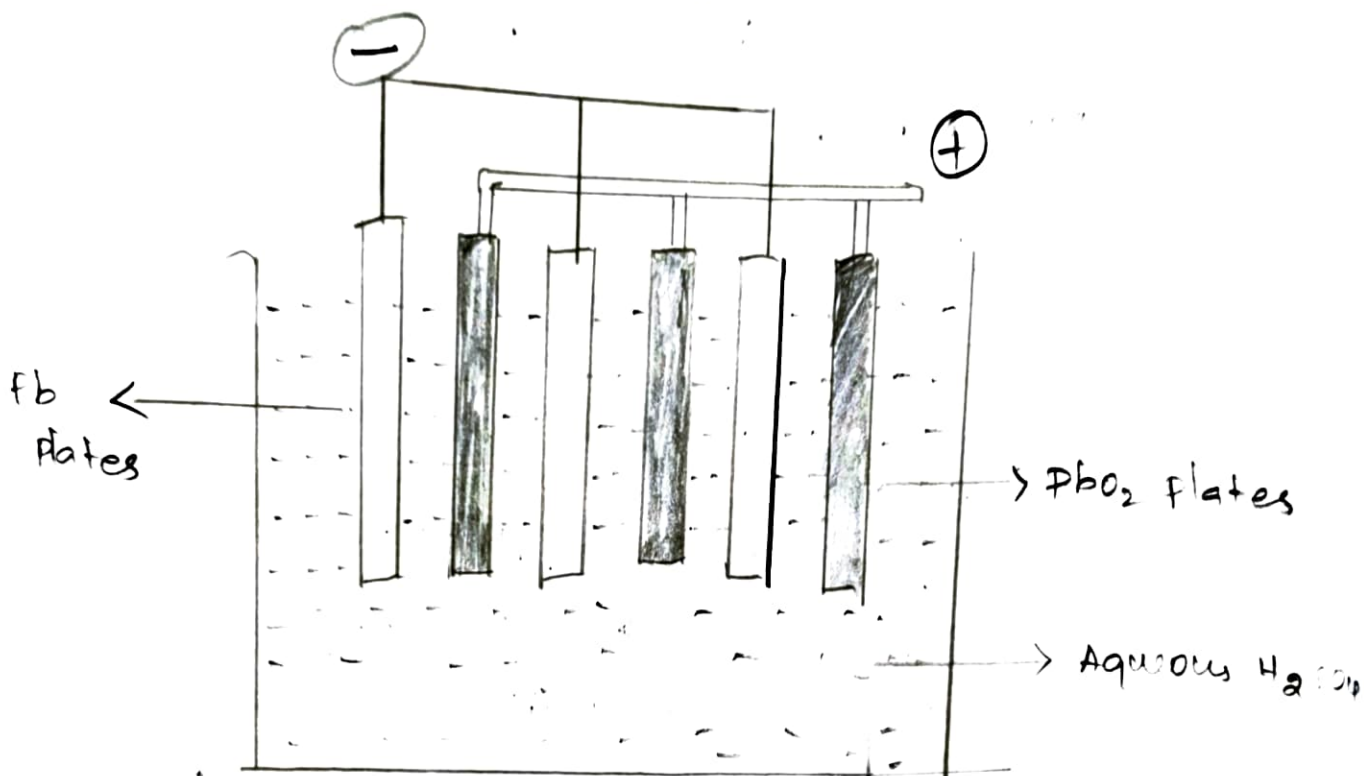


During the discharge process the consumption of sulphuric acid is replaced by an equivalent quantity of water and the sulphuric acid concentration decreases. On charging the reverse reaction takes place. During the reverse reaction water is consumed and sulphuric acid is regenerated. Hence the original strength of acid is restored. Since both of these changes are associated with variations in the specific gravity of the acid, the extent of charge or discharge of the cell at any time can be determined by testing the specific gravity of the acid.

Uses:-

* Lead - acid storage cells are used in automobiles, hospitals, telephone exchanges, etc.

* As it is rechargeable it is used in UPS (uninterrupted power supply) a power system which maintains current flow without even a momentary break, in the event of current failure.



Modern Battery

Zinc-air battery

Zinc air batteries are the batteries which breathe air that is they use oxygen directly from the air to bring about the electrochemical reaction.

These are basically alkaline batteries in which the cathodic active material is not stored in the cell.