Construction, Working and Applications of Zn-air battery

(i) Zinc-air cell

Zinc-air battery is a type of metal – air batteries, which use oxygen directly from the atmosphere to produce electrochemical energy. Oxygen diffuses into the cell and is used as the cathode reactant. The air cathode catalytically promotes the reaction of oxygen with an alkaline electrolyte and is not consumed or changed during discharge. As the cathode can be very compact, high energy densities are achieved.

The zinc-air cell consists of an anode, made up of loose, granulated powder of zinc mixed with an aqueous alkaline electrolyte (30% KOH) and a gelling agent to immobilize the composite and ensure adequate contact with zinc granules. Cathode is a carbon/catalyst mixture with a wet proofing agent coated on a nickel plated steel mesh support, and with an outer layer of gas permeable Teflon layer. The can halves housing the cathode and the anode active materials also act as the terminals. The two containers are provided by a plastic gasket as insulation between the two containers. The two electrodes are separated by an electrolyte absorbent separator. The catalyst layer contains carbon blended with oxides of manganese to form a conducting medium. A schematic representation of a typical zinc air button cell is given in Fig. 4.6. Air access holes on the cathode can provides a path for oxygen to enter the cell and diffuse to the cathode catalyst site.