



Fuel Cell



Definition

Fuel cell is a voltaic cell. It converts chemical energy of the fuels directly into electricity without combustion. In these cells, the reactants and electrolytes are continuously supplied to the cell.



Examples:

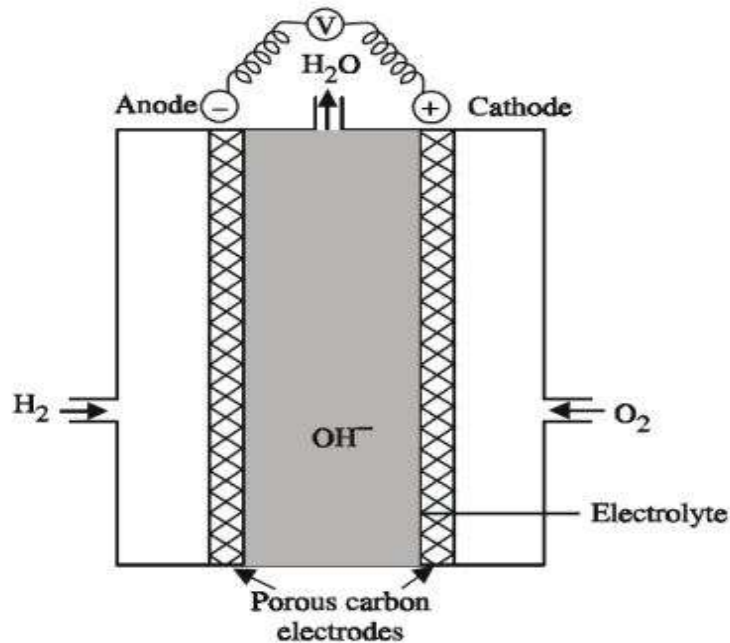
Hydrogen - oxygen fuel cell.



Fuel Cell

Hydrogen - oxygen fuel cell

It is the simplest and most successful fuel cell. The fuel-hydrogen and the oxidiser-oxygen and the liquid electrolyte are continuously supplied to the cell.





Fuel Cell

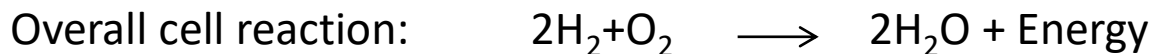
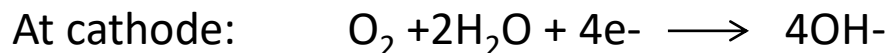
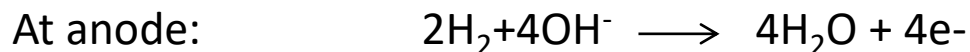
Description

- The cell has two porous electrodes, anode and cathode.
- The electrodes are made of compressed carbon containing a small amount of catalyst (Pt, Pd, Ag).
- Between the two electrodes an electrolytic solution, 25% KOH is filled.

Working

- Hydrogen passes through the anode compartment, where it is oxidized.
- Oxygen passes through the cathode compartment, where it is reduced.

Cell reactions



- **The emf of the cell = 0.8 to 1.0V**



Advantages of Fuel Cells

1. They are efficient and instant in operation.
2. They are pollution free.
3. They produce electric current directly from the reaction of a fuel and an oxidizer.
4. They are light in weight

Disadvantages

1. Fuel cells cannot store electric energy.
2. Electrodes are expensive and short lived.
3. H_2 should be pure.

Applications

1. H_2 - O_2 fuel cells are used in space crafts, submarines to get electricity
2. In H_2 - O_2 fuel cell, the product water is a valuable source of fresh water for astronauts