Section 2

Q3. Fuel Cell

→ fuel cells are efficient and quiet, operate on a variety of hydrocarbon fuels, and produces almost no objectionable emissions. The concept has been proven in numerous small scale applications. The recent infusion of power cost from fossil fuels may convert this promising device into a major source of electric power generation.

→ Principle of working

The working of the fuel cell is explained here with reference to the Hydrogen-Oxygen fuel cell using aqueous electrolyte. The fuel cell consists of an anode, a cathode and an electrolyte. Hydrogen fuel is fed into the anode side of the cell. Positive H_2 ions move from the anode side and enter the electrolyte through porous cell walls. The anode is left with a negative charge. Air is fed into the cathode side. O_2 ions enter the electrolyte leaving the cathode side with a positive charge. Excess anode electrons flow to the cathode creating a current flow. H_2 and O_2 ions combine in the electrolyte to form water which leaves the cell as steam.

→ Limitations

(a) Expensive
(b) Lack of infrastructure to support the distribution.
(c) Hydrogen is not widely available.