



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)

COIMBATORE-35

Accredited by NBA-AICTE and Accredited by NAAC – UGC with A+ Grade

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING



COURSE NAME: 19EEO305 /Renewable Energy Generation Technology

IV YEAR / VII SEMESTER

UNIT 5- OTHER RENEWABLE ENERGY SOURCES

Topic 7 – Fuel cell systems



SUCCESSFUL STUDENT

Positive
Attitude

Professionally
Groomed

Socially
Interactive

Technically
Skillful



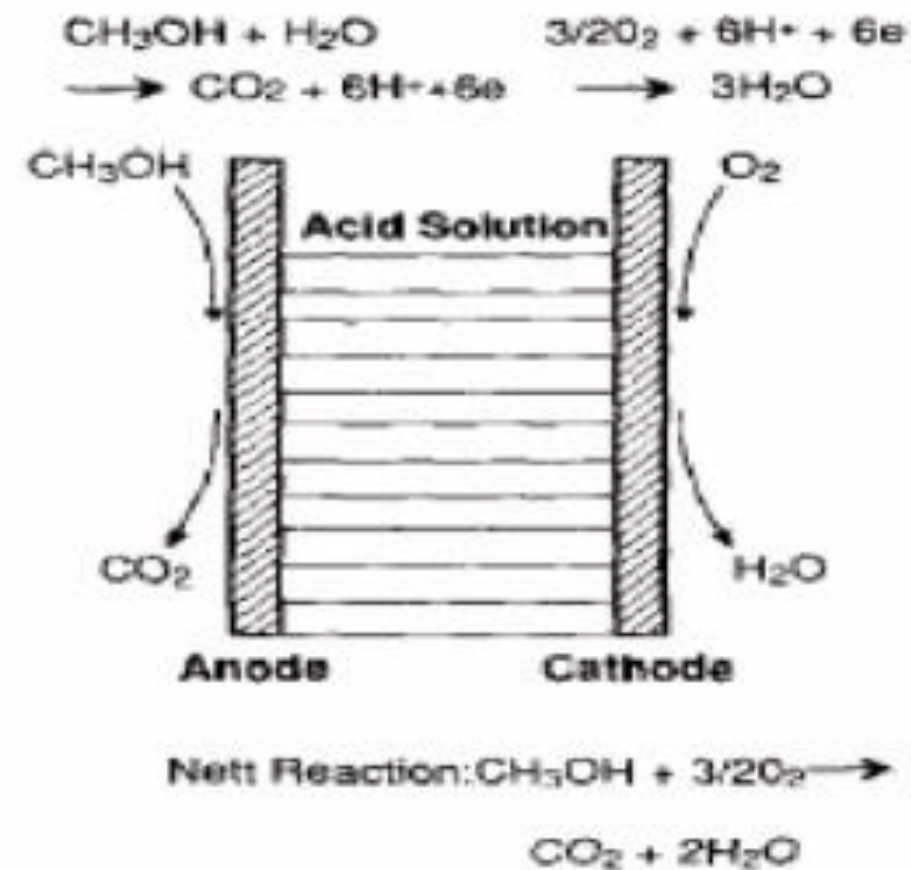
INTRODUCTION

What is Fuel cell?

- A fuel cell is an electrochemical device that converts energy produced from a chemical reaction into electrical energy.
- More specifically it is an electrochemical device that combines hydrogen and oxygen to produce electricity, with water and heat as its by-product.
- Chemical Energy → Electrical Energy.



CONSTRUCTION



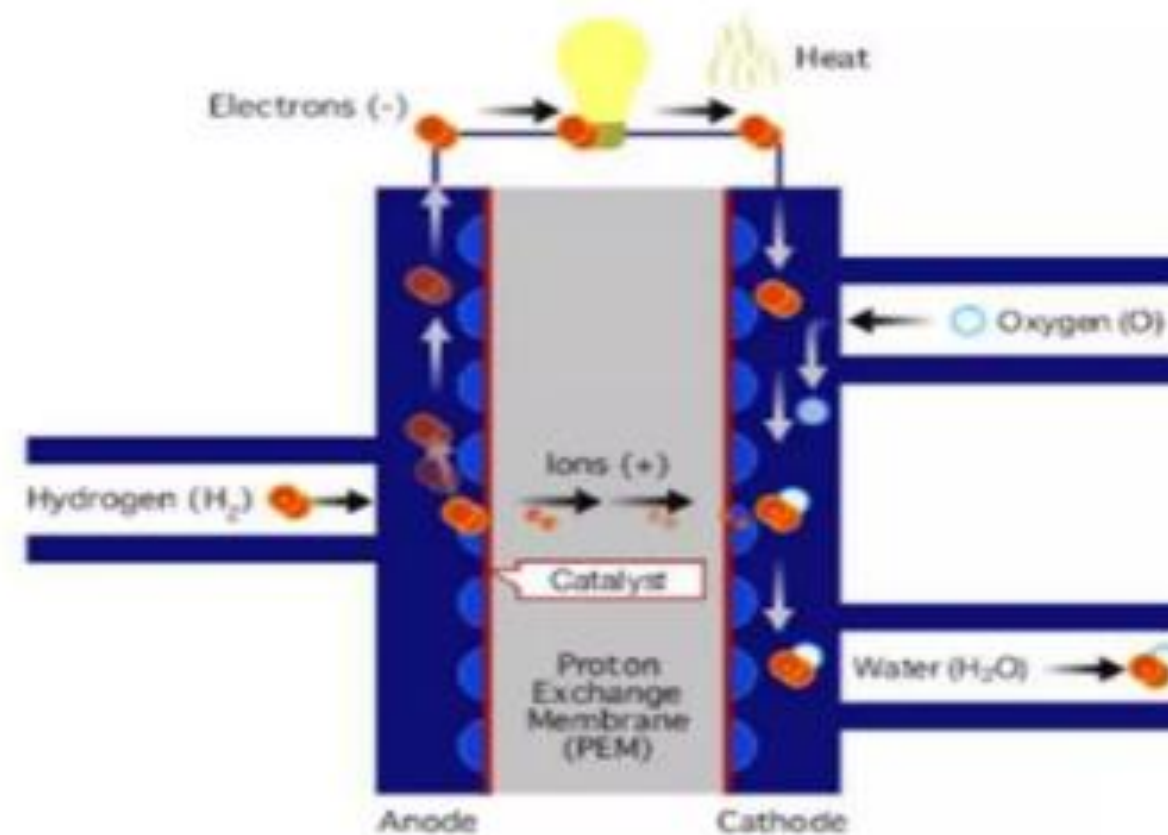
- **Anode**- Negative post of the fuel cell. Conducts the electrons that are freed from the hydrogen molecules so that they can be used in an external circuit. Etched channels disperse hydrogen gas over the surface of catalyst.



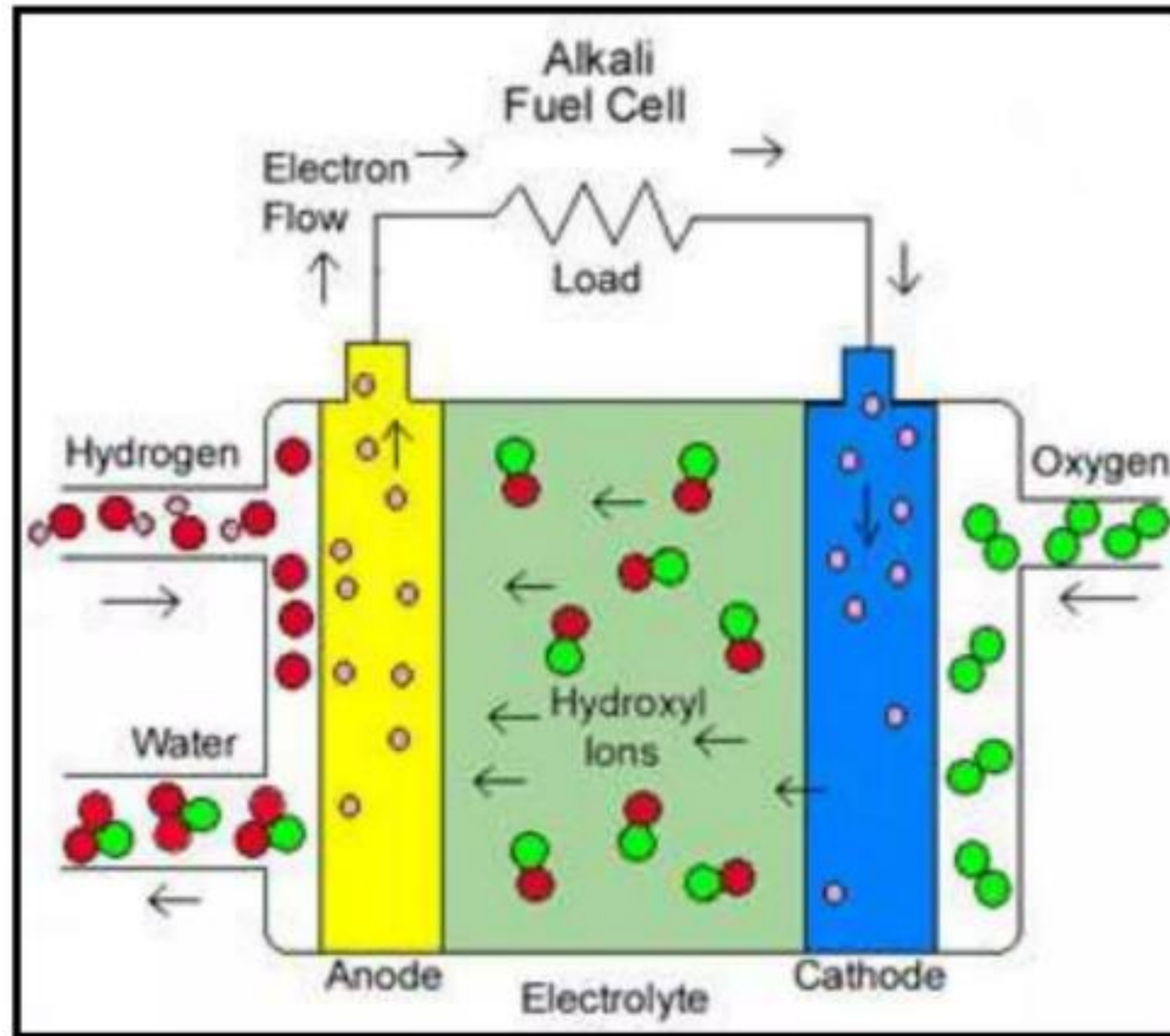
- **Cathode**- Positive post of the fuel cell. Etched channels distribute oxygen to the surface of the catalyst. Conducts electrons back from the external circuit to the catalyst. Recombine with the hydrogen ions and oxygen to form water.
- **Electrolyte**- Proton exchange membrane. Specially treated material, only conducts positively charged ions. Membrane blocks electrons.
- **Catalyst**- Special material that facilitates reaction of oxygen and hydrogen. Usually platinum powder very thinly coated onto carbon paper or cloth. Rough & porous maximizes surface area exposed to hydrogen or oxygen. The platinum-coated side of the catalyst faces the PEM.



- When hydrogen gas is introduced into the system, the catalyst surface of the membrane splits hydrogen gas molecules into protons and electrons. The protons pass through the membrane to react with oxygen in the air (forming water). The electrons, which cannot pass through the membrane, must travel around it, thus creating the source of DC electricity.



ALKALINE FUEL CELL





ASSESSMENT



publicdomainvectors.org





REFERENCE



Reference Book:

1. S.P. Sukhatme, 'Solar Energy', Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997. (UNIT II)
2. G.N. Tiwari, 'Solar Energy – Fundamentals Design, Modelling and applications', Narosa Publishing House, New Delhi, 2002. (UNIT II)
3. S.M. Muyeen, " Wind Energy Conversion Systems: Technology and Trends", Springer 2012. [UNIT III]

Text Book:

1. G.D. Rai, 'Non Conventional Energy Sources', Khanna Publishers, New Delhi, 2006. (UNIT I - V)
2. D.P.Kothari, K.C.Singal and Rakesh Ranjan,"Renewable energy sources and Emerging Technologies", PHI Pvt. Ltd., 2009. (UNIT I-V)



THANK YOU!!

