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 6 – Hydrogen production and storage

SUCCESSFUL STUDENT

Positive Attitude

Professionally Groomed

Socially Interactive

Technically Skillful

Advantages of Hydrogen

Why Hydrogen?

Think individually about what you know about hydrogen and its advantages, discuss with your neighbor(s), and be prepared to share your answer.

Hydrogen Production

- There is no natural source of hydrogen
- Hydrogen can be considered as a **energy carrier**, not an energy source.
- To supply the hydrogen for energy needs, economical processes are needed to produce hydrogen from abundant energy sources

Hydrogen Production – Fossil Fuels

- In the short-term, hydrogen may produced from fossil fuels
  - Natural gas
  - Coal
  - Gasoline
- Advantages:
  - Established distribution networks
  - Economical conversion processes
- Disadvantages:
  - Finite resources
  - Shift pollution problem, but don't eliminate it!

Hydrogen Production – Natural Gas

- Other conversion technologies have been commercialized or are being studied:

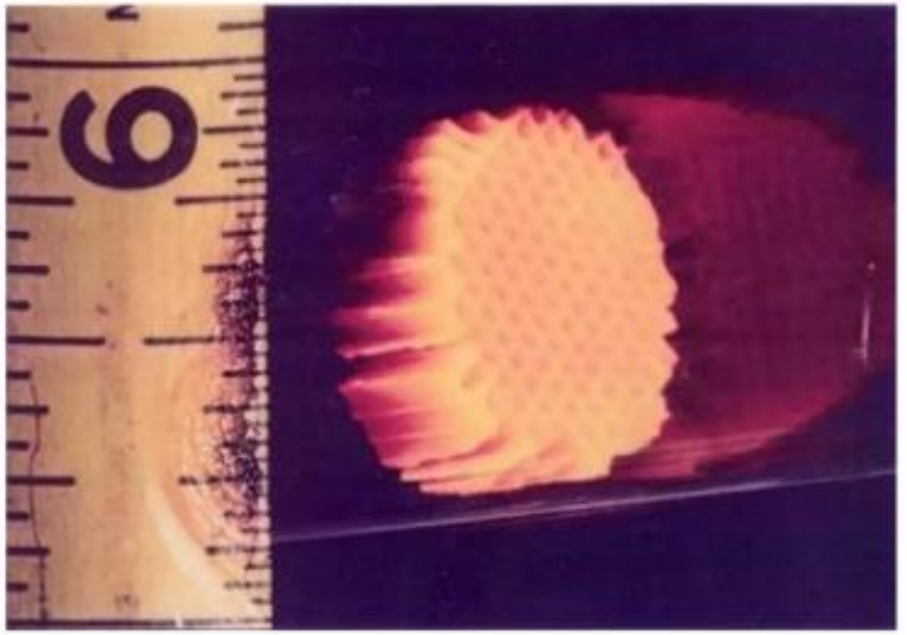
- Partial Oxidation

$$CH_4 + O_2 \rightarrow CO + 2\ H_2 \quad \Delta H_{Rx} = -8.5\ \text{kcal/mol}$$

- Autothermal reforming

  Combination of partial oxidation and steam reforming. Methane is partially combusted and then reformed. Combustion drives reforming reaction, so no heat needs to be added.

Hydrogen Production – Natural Gas



Catalytic partial oxidation of methane over a noble metal-coated ceramic monolith

ASSESSMENT

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!!