Chemistry 500: Chemistry in Modern Living

Topic 6: New Energy Sources for the New Century

Alternative "Green" Energy Sources

Chemistry in Context, 2nd Edition: Chapter 9, Pages 281-318

Chemistry in Context, 3rd Edition: Chapter 8, Pages 305-336

Outline Notes by Dr. Allen D. Hunter, YSU Department of Chemistry, ©2000.

Outline

6A Why not stick with the Energy we are using now?

- Ask Students: What are the strengths of current energy mix
  - Group Activity

- Ask Students: What are the problems with current energy mix
  - Group Activity

- Alternative Energy Sources
  - Intermittent supplies and energy storage

6B Solar Energy

- Photovoltaics (Solar Cells)
  - Graphics from Text: Figure 9.11 in 2nd Edition and 8.14 in 3rd Edition, Photovoltaic Cell
  - Graphics from Text: Figures 8.16 and 8.17 in 3rd Edition, Photovoltaic arrays
  - Ask Students: Develop a list of current uses of Photovoltaic technology
    - Group Activity
  - Ask Students: Develop a list of future uses of Photovoltaic technology
    - Group Activity

- Photothermal Energy
  - Passive heating
    - Graphics from Text: Figure 9.1 in 2nd Edition, Passive Solar Heating
  - Solar thermal on land
  - Solar thermal from oceans
- Costs
  - R&D
  - Capital
  - Operating
  - Land Area
- Benefits

6C Wind Power

- Wind farms
  - Graphics from Text: Figure 9.2 in 2nd Edition: Wind Farm
  - Ask Students: What are some of the advantages and disadvantages of Wind Energy
    - Group Activity

6D The Hydrogen Economy

- Hydrogen production
  - Current industrial route
    - Made from hydrocarbon fuels
  - Electrolysis
    - Graphics from Text: Figure 9.6 in 2nd Edition and 8.2 in 3rd Edition, Electrolytic cell
  - Photolytic Hydrogen Generation
- Hydrogen storage: energy density

6E Biomass and Garbage

- Everything old is new again

- Thermal generation of electricity

  - Industrial Waste

  - Household Waste

  - Agricultural Waste

- Ask Students: What are the strengths and weakness of this sort of alternative energy

  - Group Activity

Index of Vocabulary and Major Topics