AP CHEMISTRY CHAPTER 6 OUTLINE

THERMOCHEMISTRY

6.1-ENERGY:

Law of Conservation of Energy

Potential Energy

Kinetic Energy

Frictional Heating

Temperature

Heat

Work

Pathway

State function (property)

Chemical Energy

System

Surroundings

Exothermic

CH4(g) + 2O2(g) → CO2(g) + 2H2O + energy (heat)

Endothermic

N2(g) + O2(g) + energy (heat) → 2NO(g)

Thermodynamics

First Law of Thermodynamics

Internal energy

(Change) Internal Energy : ΔE = q + w

The magnitude and the sign of the change: the conventions

Work involving gases: a derivation

6.2- ENTHALPY AND CALORIMETRY

Enthalpy

Calorimetry and ΔH = mCΔT (msΔT)

Specific Heat Capacity and Molar Heat Capacity

Constant Pressure Calorimetry

Constant Volume Calorimetry: A “bomb calorimeter”

How this is used-energy transfer

6.3: HESS’S LAW

Characteristics of Enthalpy Changes

1. If the reaction is reversed, the sign of ΔH is also reversed
2. The magnitude of ΔH is directly proportional to the quantities of reactants and products in a reaction. If the coefficients in a balanced reaction are multiplied by an integer, the value of ΔH is multiplied by the same integer

6.4: STANDARD ENTHALPIES OF FORMATION

ΔHfo

Standard States

For a Compound

For an Element

ΔHoreaction = ∑ ΔHfoproducts - ∑ ΔHforeactants

6.5: PRESENT SOURCES OF ENERGY

Petroleum and Natural Gas

Coal

Effects of Carbon Dioxide on Climate

6.6: NEW ENERGY SOURCES

Coal Conversion

Hydrogen as a Fuel

Other Energy Alternatives