# CHAPTER 17: THERMOCHEMISTRY – HEAT AND CHEMICAL CHANGE

**I. Flow of energy-heat**

**A. energy transformations**

i. thermochemistry – heat changes during rxns
ii. chemical potential energy – energy in chem. bonds
iii. heat (q) – energy transfers betw objects due to temp diff

**B. endo/exothermic**

i. system – what you are focused on
   1. surroundings are outside system
ii. energy never created/destroyed
iii. positive q = endothermic, flows into system
iv. negative q = exothermic, flows out of system

**C. heat capacity/specific heat**

i. 1 Calorie = 1000 calories
ii. 1 calorie = 4.184 joules (1 Calorie = 4184 joules)
iii. calorie = 1 g water $1^0$C
iv. heat capacity – just raise substance $1^0$C
v. specific heat ($C_p$) – raise 1 g of substance $1^0$C
vi. $q = m \times C_p \times \Delta t$ or $C_p = \frac{q}{m \times \Delta t}$

units of $C_p$ are $\frac{J}{g \times C^0}$

**II. Calorimetry**

**A. Measuring how much heat (enthalpy) a reaction will take in/give off**

**B. solve same as heat, using ΔH instead of q**

**C. thermochemical equations**

1. EX: $CaO + H_2O \rightarrow Ca(OH)_2 + 65.2$ kJ
   a. Exothermic, product
   b. How much heat given off if you have 32 g of CaO?
      i. $\frac{32 \text{ g CaO}}{} \mid \frac{1 \text{ mole CaO}}{56 \text{g CaO}} \mid \frac{65.2 \text{ kJ}}{1 \text{ mole CaO}}$

      = 37 kJ

2. $CH_4 + 2O_2 \rightarrow CO_2 + 2\ H_2O + 890$ kJ

   Is the same as

   $CH_4 + 2O_2 \rightarrow CO_2 + 2\ H_2O$ $\quad \Delta H = -890$