

## 17.2 Notes - Measuring and Expressing Enthalpy Changes

Calorimetry - measurement of the heat flow into or out of a system for chemical & physical processes.  
\* remember: endo (IN), absorbed. exo (EXIT) released

Calorimeter - insulated device used to measure the absorption or release of heat

Enthalpy (H) - accounts for the heat flow of the system at constant pressure. This  $\Delta H$  is determined by measuring the heat flow of the reaction ( $q = \Delta H$ )

- take specific heat equation and get  $q$  alone to find the heat absorbed/released by surroundings.

$$C = \frac{q}{m \Delta T} \rightarrow q_{\text{sur}} = C \times m \times \Delta T$$

- $\Delta H$  is positive in endothermic reactions, and negative in exo
- If system is endothermic and has positive value for  $\Delta H/q_1$ , then the surroundings MUST have a negative value ( $-q_{\text{sur}}$ ) and be exothermic.

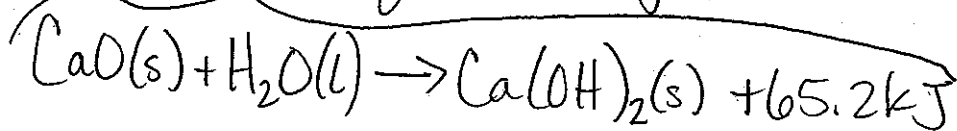
$$q_{\text{sys}} = \Delta H = -q_{\text{sur}} = -C \times m \times \Delta T$$

- Enthalpy change in a reaction may be expressed as a reactant or a product. ex)  $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca(OH)}_2 + \underline{\underline{65.2 \text{ kJ}}}$

Thermochemical equations - equations that include or express this enthalpy change.

Heat of reaction - the enthalpy change for the chemical equation (exactly as it is written) - usually seen as  $\Delta H$

\* In a thermochemical equation, physical state must be shown



\* Because  $\Delta H$  is produced in this equation, this must have been an exothermic reaction because heat was given off. Therefore,  $\Delta H = -65.2 \text{ kJ}$  to represent exothermic

$\Delta H$  (heat of reaction)  
@ 101.3 kPa and  
25°C

