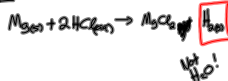


Unit 1 Test Wednesday Nov 19th

Lab #2: Friday

Type: Reaction #3:



Unit I Summary of Concepts:

① Heat & Temperature

Temp: Avg KE of Particles

Heat: Measure of Thermal energy

② Endo & Exo Reactions

Endo: Energy Enters system

Exo: Energy Leaves system

③ System & Surroundings

System: Object of interest, possibly a rxn.

Surroundings: Anything that the system can exchange heat with (exchange)

Types of Systems:

Open, Closed, Isolated

④ Measuring Heat Changes:

For KE Changes:  $q = m\Delta T$

$$q = C\Delta T$$

C is the heat capacity

$$C = \frac{J}{^\circ C} \quad C = \frac{J}{^\circ C}$$

For PE Changes:  $q = n\Delta H$

$\Delta H$  is the energy change per mole of a system (Phase Changes, Chem Rxns)

⑤ Representing Enthalpy Changes

- Thermochemical Rxn (energy is reactant/product)
- Enthalpy Diagram
- Enthalpy Notation (like when we do Hess' Law)

⑥ Heating/Cooling Curves:

A Temperature profile of a substance over time.

• Increase/Decrease in Temp. - KE -  $q = m\Delta T$

• Flat Parts, phase change,  $q = n\Delta H$

⑦ Calorimetry: Experimental method

for determining energy data about a substance (Use to find:  $\Delta H$ , C, C, FV)

$$q_{\text{sys}} = -q_{\text{surr}}$$

- Assumptions may include:
  - \* Constant  $C_{\text{water}}$
  - \* No Heat Loss
  - \* Complete Reaction

• Problem Types may vary:

- Bomb Calorimeter
- 2 Solutions mixed
- Solid placed in solution

• A T Chart is highly useful!

⑧ Hess' Law: A series of reactions that produce an overall reaction will have the same  $\Delta H$  value as if that reaction took place in 1 step.

Strategies: - Identify Target Rxn

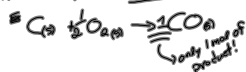
- Find 'interim' chemicals in the given reactions.

⑨  $\Delta H_f$  Problems (Hess' Law Pt. 2)

$$\Delta H_{\text{rxn}} = \sum \Delta H_f \text{prod} - \sum \Delta H_f \text{react}$$

Solve for: ①  $\Delta H_{\text{rxn}}$  ②  $\Delta H_f$  of a chemical

\* Note: A formation reaction is the reaction to produce a compound from its elements, in their standard state.



⑩ Bond Energy: BERP!