Chapter 8 – Thermochemistry

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January 7, 2021

- Reactions either absorb heat or release it:
  1. Exothermic Reaction – Releases heat
  2. Endothermic Reaction – Intakes heat
- $q = cm\Delta T$, where c is the specific heat and q is the heat/energy
- Units of specific heat are $\left[\frac{\text{J}}{\text{g}\,\text{C}}\right]$
- Enthalpy (ΔH) – Reaction heat content. If $\Delta H < 0$ the reaction is exothermic, but if $\Delta H > 0$, the reaction is endothermic.
- ΔH for a reaction is equal but opposite in sign for reverse.
- Hess's Law – ΔH for a reaction is same whether it occurs directly or in a series.
  1. The enthalpy is the same for the following reactions:

$$\text{A} \rightarrow \text{D}$$

$$\text{A} \rightarrow \text{B} \rightarrow \text{C} \rightarrow \text{D}$$

- The Enthalpy of formations, ΔH_f, is the energy to form compounds: $\Delta H = \sum$ products $- \sum$ reactants
  1. Single, non-charged atoms (ex. O_2) equal zero
- ΔH may also be calculated through bond energies. ΔH = Break – Make.
- First line, heat of fusion, second line, heat of vaporization (it takes more energy to boil something than to melt something)
- Energy is only given off when a bond is made. It takes energy to break bonds.

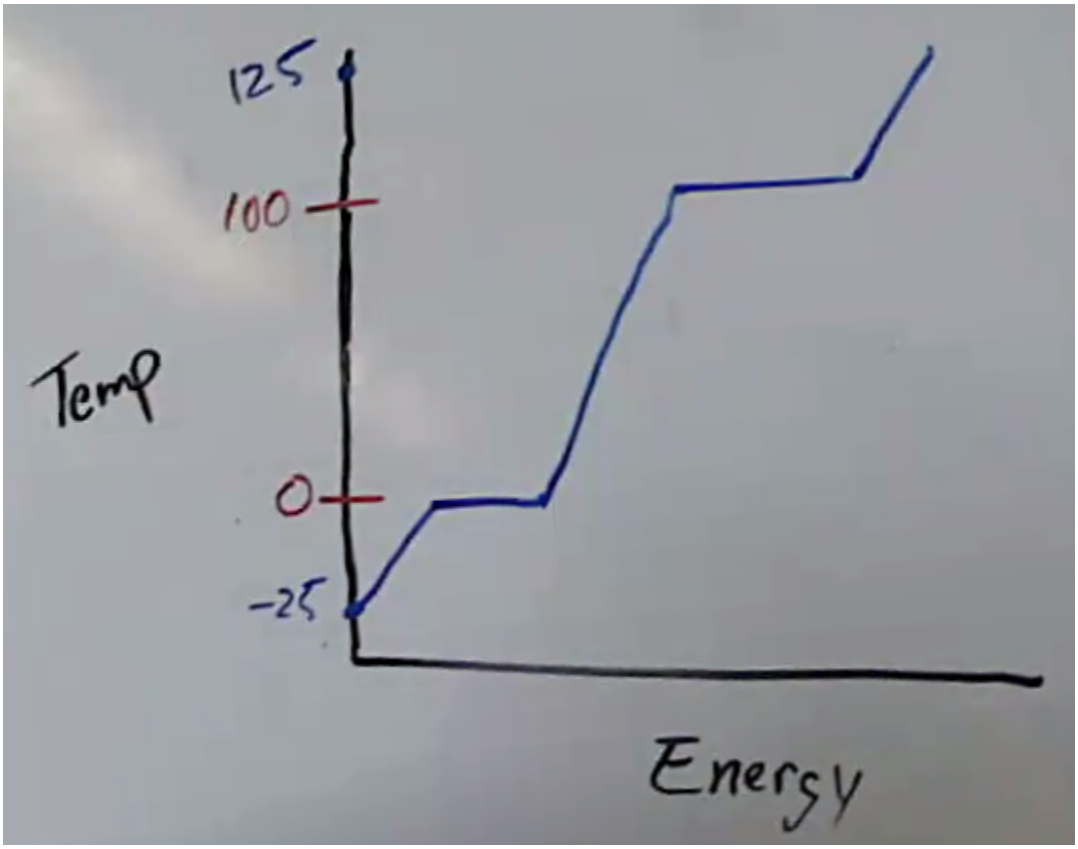

Figure 1: Heating/Cooling Curve for H_2O