

1-30-17 Notes : Finding ΔH of a Reaction

ΔH = change in heat (enthalpy)

Heat = transfer of energy from 1 substance to another
unit: Joules (J) or calories (cal)

$$\left(\begin{array}{l} 1 \text{ cal} = 4.18 \text{ J} \\ 1 \text{ kcal} = 4.18 \text{ kJ} \end{array} \right)$$

To find heat gained/lost in a reaction you need to know:

- ① mass of substance being heated/cooled (mass)
- ② type of substance " (specific heat)
- ③ temp change of substance " (Δt)

EQ

$$\begin{array}{l} \text{heat} \\ \text{gained/} \\ \text{lost} \\ \text{(J or cal)} \end{array} \rightarrow \overset{Q}{=} m \cdot c_p \cdot \Delta t$$

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specific heat: every pure substance will have a different Δt when exposed to same amt. of heat

ex) H_2O : $\left(\frac{1.00 \text{ cal}}{1 \text{ g} \cdot 1^\circ\text{C}} \right)$ Al : $\left(\frac{0.22 \text{ cal}}{1 \text{ g} \cdot 1^\circ\text{C}} \right)$

Sample problem:

① You perform a reaction under 100. g of H_2O and the water changes $1.4^\circ C$. Find the energy absorbed by the H_2O

$$Q = ? \text{ cal}$$

$$m_{H_2O} = 100. \text{ g}$$

$$C_{pH_2O} : \frac{1 \text{ cal}}{\text{g} \cdot ^\circ C}$$

$$\Delta t = 1.4^\circ C$$

$$Q = 100. \text{ g} \left(\frac{1.00 \text{ cal}}{\text{g} \cdot ^\circ C} \right) (1.4^\circ C)$$

$$Q = 140 \text{ cal absorbed by } H_2O$$