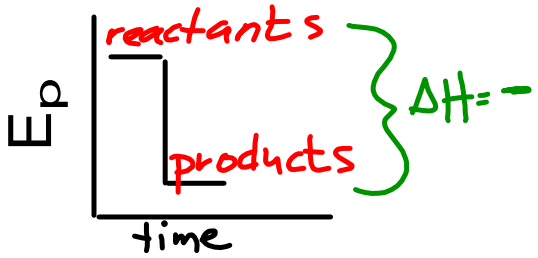
Communicating Enthalpy

Enthalpy is the total amount of energy associated with a substance or reaction.

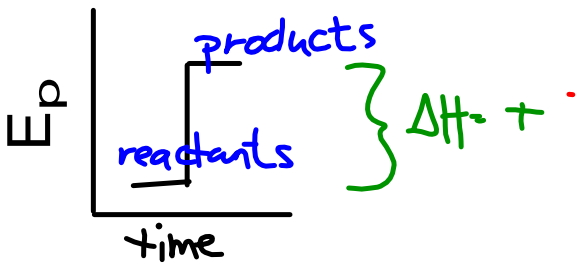
1. Thermochemical equations: (energy in reaction)
Exothermic process: heat is expressed in the products (as a + number)
Endothermic process: heat is expressed in the reactants (as a + number)

2. As integers: (ΔH beside reaction)
Exothermic process: negative energy flow is expressed as a negative value.
Endothermic process: positive energy flow is expressed as a positive value

3. Potential energy diagrams:
Exothermic process:



Endothermic process:



Change in enthalpy vs Molar enthalpy

ΔH - change in enthalpy KJ

H - molar enthalpy KJ/mol

$\Delta H = n H$ (n = moles)

H_{fus}

H_{vap}

H_{rxn}

H_{dog}

$$2H_{2(g)} + O_{2\ (g)} \text{ ----> } 2H_2O_{\ (g)} + 100.2\ KJ \qquad \Delta H$$

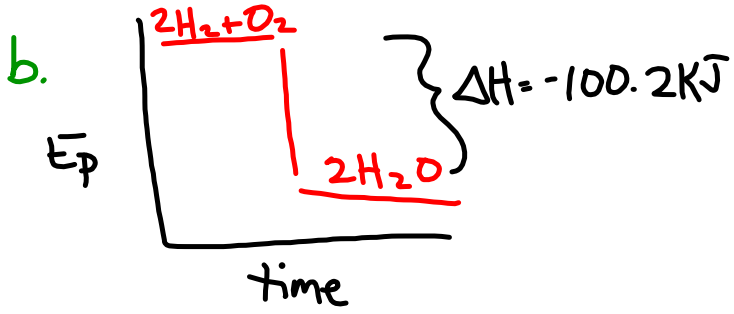
a. express as an integer.

b. potential energy diagram

c. Calc. the molar enthalpy for hydrogen.

a. $2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(g)} \quad \Delta H = -100.2\ KJ$

b.



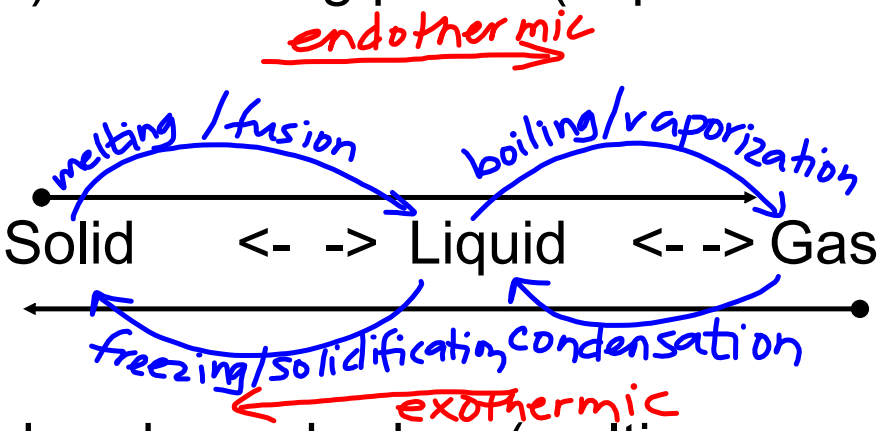
c. $\Delta H = nH^{-?}$

$$H = \frac{\Delta H}{n} = \frac{-100.2\ KJ}{2\ mol}$$

$$H = -50.1\ KJ/mol$$

Heats of Change of States:

Phase changes take place at melting (fusion) and boiling points (vaporization)



When bonds are broken (melting, vaporization), energy is absorbed, potential energy increases and the process is endothermic.
When bonds form (freezing, condensing), energy is released, potential energy decreases and the process is exothermic.

$\Delta H_{fus} = -\Delta H_{sol}$ $\Delta H_{vap} = -\Delta H_{cond}$