

Enthalpy & Thermochemical Equations

↓
the heat (q)
of a process
at constant
pressure.

The symbol
for enthalpy
is: H
↓

The change in
enthalpy of a reaction,

ΔH_{rxn}
is the change in energy
that occurs when bonds
are broken in the reactants
& new bonds form in the
products

$$\Delta H_{rxn} = H_{products} - H_{reactants}$$

↳ you won't have to calculate
this, just understand where
 ΔH_{rxn} comes from.

OK, it sounds scary but it's not!
It's just a balanced chemical equation
(including states of matter) and the change
in enthalpy of the reaction, ΔH_{rxn}

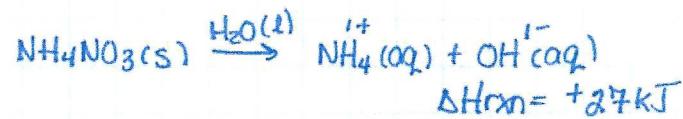
Examples

1) reaction in an instant heat pack



fairly exothermic,
giving off heat

2. reaction in a cold pack



endothemic,
absorbs heat from
your body.

- You can also write thermochemical equations when a substance changes its state of matter (such as boiling or melting)

boiling

enthalpy of vaporization

$$\Delta H_{vap}$$

condensing

enthalpy of condensation

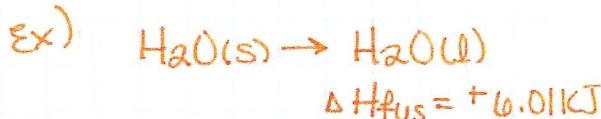
$$\Delta H_{cond}$$



melting

enthalpy of fusion

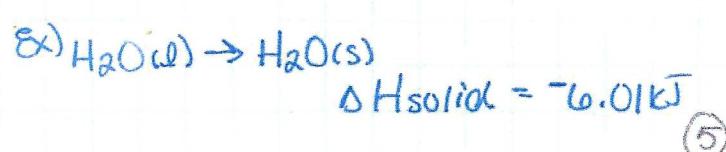
$$\Delta H_{fus}$$



freezing

enthalpy of solidification

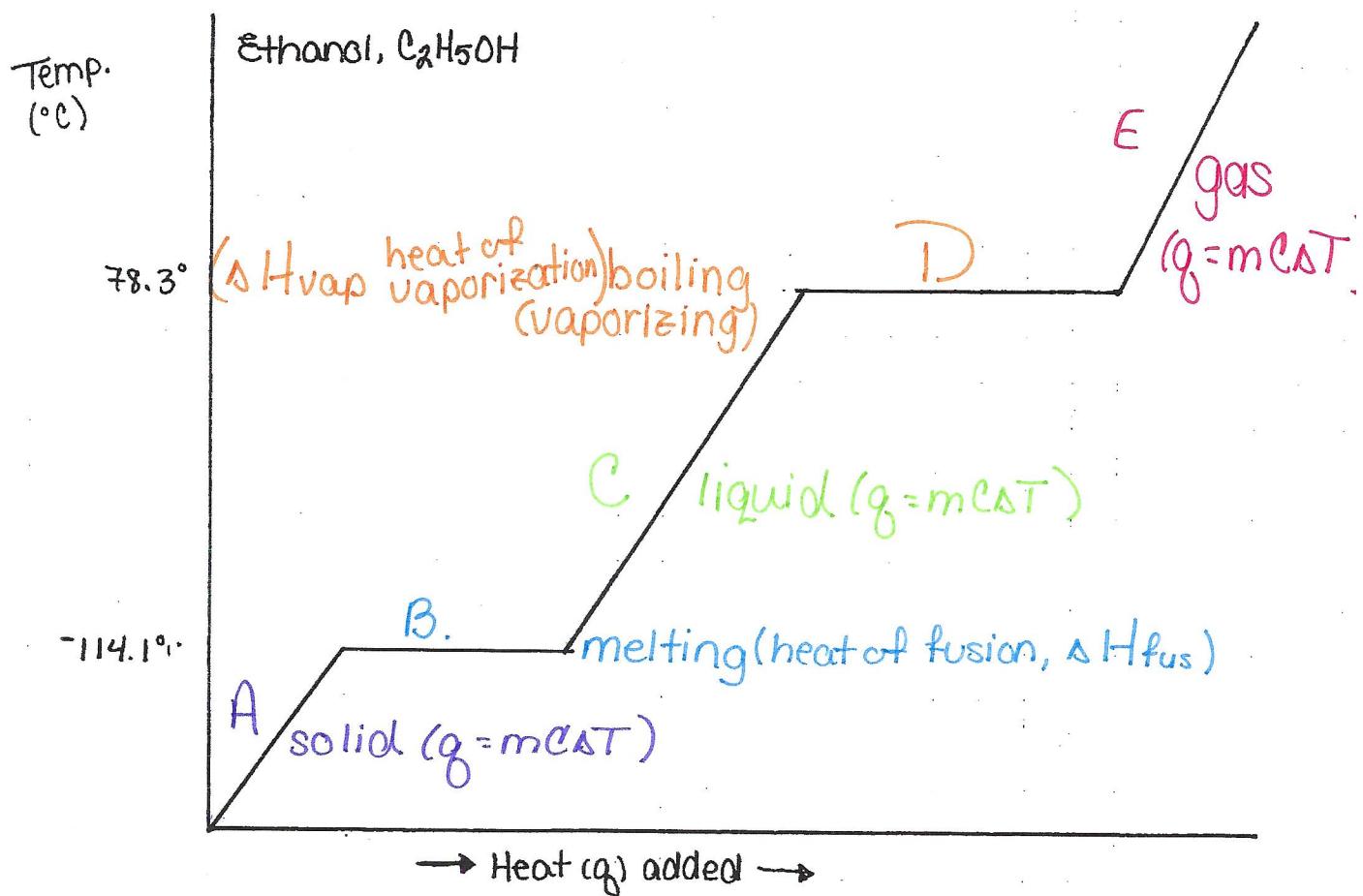
$$\Delta H_{solid}$$



⑤

Heating Curve

shows what happens, thermodynamically, as a substance is heated and changes states of matter.



A. solid - by adding heat, all of the energy goes into increasing the temperature of the solid ($\uparrow KE$)

B. melting - all the energy added goes towards melting the solid & NOT increasing its temperature. The temperature will NOT change until all the solid is melted. (no increase in KE)

C. liquid - all the energy goes into increasing the temperature of the liquid ($\uparrow KE$)

D. boiling - all the energy goes into boiling the liquid & NOT increasing its temperature (no increase in KE)

E. gas - all the energy goes into increasing the temperature of the gas ($\uparrow KE$)