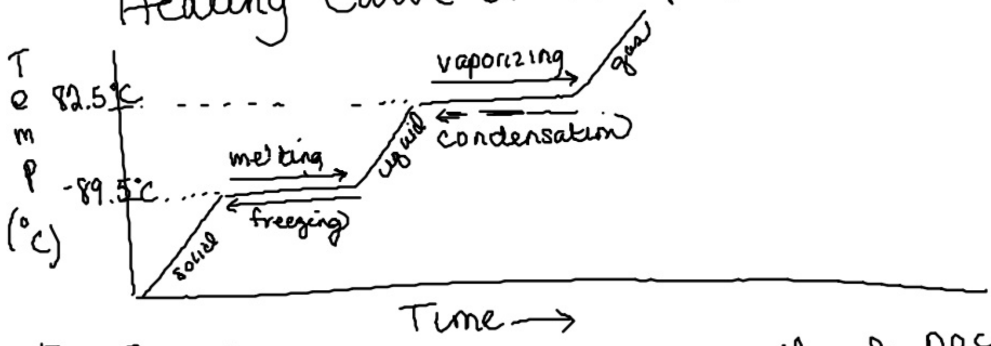
4/11/15

Hmwk:

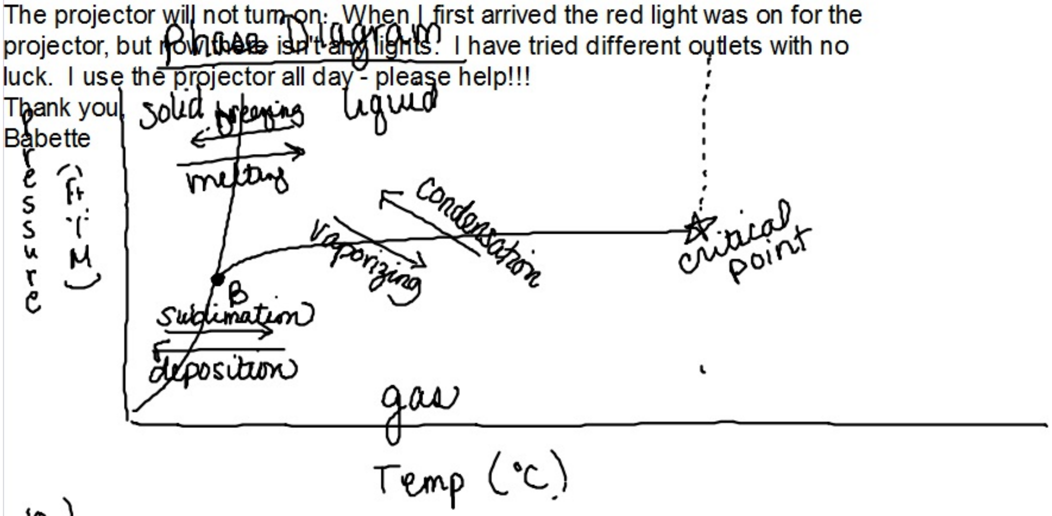
1. a, c, d, g
2. H_2O can dissolve most things - because of its shape + polarity
3. The intermolecular forces cause adhesion + cohesion
4. H_2O requires a great deal of energy to change temp, and retains temps for a long time.

Heating Curve of Isopropanol



5. 82.5°C 6. -89.5°C 7. solid 8. no change in temp. time needed to gather energy

The projector will not turn on. When I first arrived the red light was on for the projector, but now there isn't any lights. I have tried different outlets with no luck. I use the projector all day - please help!!!
Thank you,
Babette



10.) B. = Triple point = all three phases exist at the same time

11.) E (melting)

12). F

14.) the point at which you can no longer liquify a gas.

15.) Steam @ 100°C Steam has greater energy.

Thermochemistry

measurement of the changes in energy for a system

energy is measured in calories, (Calories, joules + kilojoules)
cal, Cal, J, KJ

1 calorie is the energy required to heat 1 gram of H_2O by 1°C.

* 1 cal = 4.184 joules * memory work.

Temperature 0°C = 273K (°C + 273 = K)

-273°C = 0K (K - 273 = °C)

Energy = (mass)(ΔT)(C_p) ← when temp changes

Energy = (mass)(Heat of fusion or vaporization) ← no ΔT

memory work

$\Delta T = T_{final} - T_{initial}$

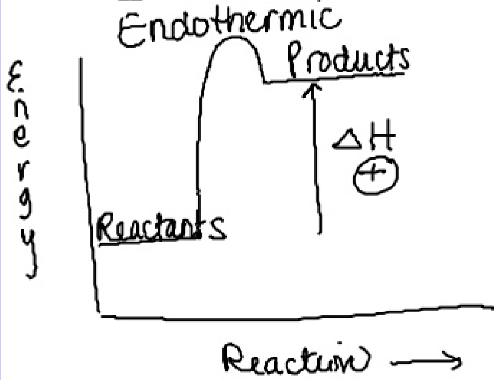
C_p = Specific Heat Capacity (varies by phase)

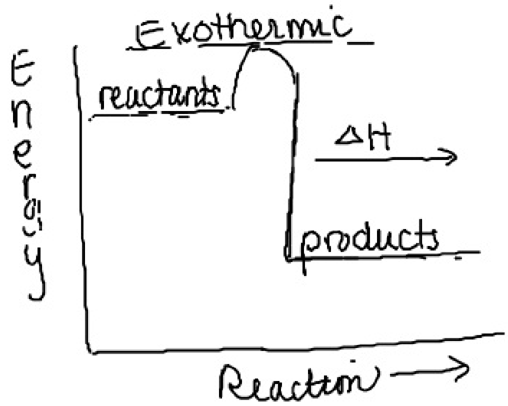
* $C_{p_{H_2O}} = 1\ cal/g°C = 4.184\ J/g°C$ * memory work

We evaluate the energy (q) by calculating ΔH. (Heat)

Sign of ΔH

(+)	endothermic	heat is absorbed
(−)	exothermic	heat is released





$$\Delta H_{reaction} = \Delta H_{Products} - \Delta H_{reactants}$$

$\Delta H_{formation} = \emptyset$ if pure element or diatomic

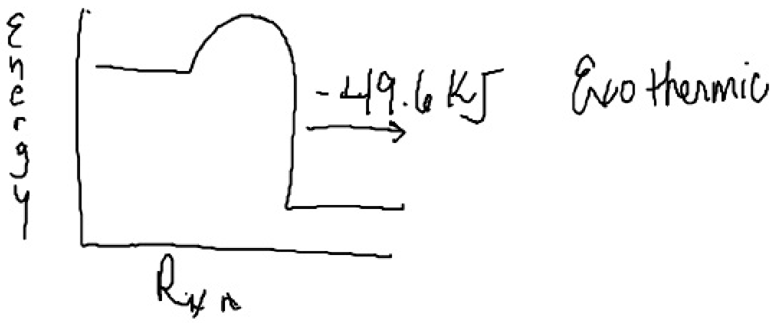
coefficient from balanced reaction = moles.

$$2\,NaBr(s) + Cl_2(g) \rightarrow 2\,NaCl(s) + Br_2(g)$$

$$\Delta H_{rxn} = \left(2\,\text{mol}_{NaCl} \cdot -385.9\ \text{kJ/mol} + \emptyset\right) - \text{(subtract)}$$

$$\left(2\,\text{mol} \cdot -361.1\ \text{kJ/mol} + 0\right)$$

$$\Delta H_{rxn} = -771.8\ \text{kJ} - {-722.2}\ \text{kJ} = \boxed{-49.6\ \text{kJ}}$$



Practice

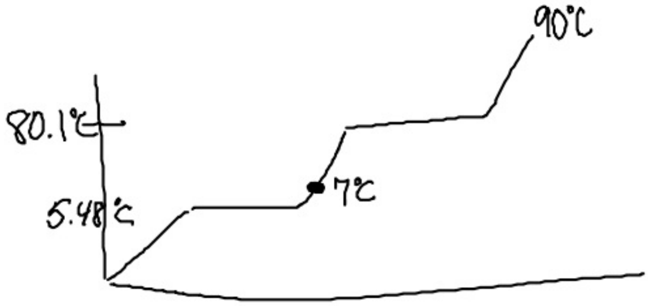
1. $\Delta H_{rxn} = \Delta H_{Products} - \Delta H_{reactants}$

$2\ KBr(s) + I_2(g) \longrightarrow 2\ KI(s) + Br_2(g)$

$\Delta H_{rxn} = (2\text{mol} \cdot -327.9\ \text{KJ/mol} + 0) - (2\text{mol} \cdot -393.8\ \text{KJ/mol} + 0)$

$(-655.8\ \text{KJ}) - (-787.6\ \text{KJ}) =$

131.8 KJ Endothermic



Heating curve Practice

#1 - 100.0g of benzene

$C = (100.0g)(73.1°C)(1.74\ J/g°C) = 1271.94J$

$D = (100.0g)(395\ J/g) = 39500J$

$E = (100.0g)(9.9°C)(1.04\ J/g°C) = 1029.6J$

Total = 41801.54 J → **4.2×10^4 J**

1 cal = 4.184 J

$52\ \text{cal} \times \frac{4.184\ J}{1\ \text{cal}}$