# Messy Notes #4 Part 1

Isabel Feige
11/9/26

Key
— = important
[ = grouping

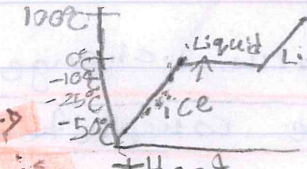
Key (continued)
= fill in blank/elaborate
= comments
= question
★ = important/key detail

not collected but useful

## Phase Change Notes
## Heat of Fusion for Ice Lab

★ $\Delta Q = m \cdot \Delta T \cdot C_p$

★ Phase change




y axis: is temperature.




Who discovered phase changes?

I didn't really know about plasma

★ Ice can warm to 0°C without melting

I never thought about this! very interesting

★ Heat can change state of matter.

4 states of matter.
- Liquid.
- Gas.
- Plasma (fire)
- Solid.

Who discovered this?

I didn't know that fire was called plasma!

• 0°C ice melts into 0°C water.

★ Water won't warm till all ice melts.

• As long as water is in pot, pot won't get over 100°C

the water in the pot.

• Phase transitions. ← when something transitions from one phase to another.

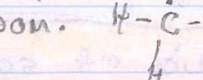
• Steam and fog is transition of gas → water.

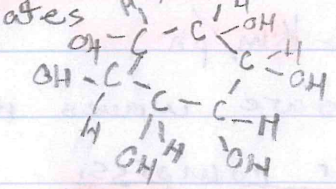
• Fire is made of → Products.

We did a unit on Chemistry last year.

★ $C_3H_8 + O_2 \longrightarrow CO^2 + H_2O$ ← water

reactants: propane, oxygen; carbon dioxide

• Hydrocarbon.  ← things we burn.

• Carbohydrates  ← things we eat.

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- ★ In general cold stuff: solid → liquid → gas → plasma.
  - are there times when this doesn't work besides solid → gas?
  - goes from.
- ★ Phase change don't involve change temp. till phase change complete.
  - Any solid.
  - Solid ice $0^{\circ}C$ → liquid ice $0^{\circ}C$
  - Add heat to cause phase change.
    - you can add heat to cause a phase change
  - Phase changes don't involve temperature changes until the phase change is complete.
  - Phase change not temp. change.
    - Water: 4.2 J ~~per~~ to raise 1°C per 1°C
    - Each has diff. ~~Cp.~~ different.
  - state not. temp. change.
- Heat of fusion.
  - Ex: liquid → solid
- ★ If you pull heat out it goes backwards.
- Fuse: liq → sol. ← liquid to solid.
- Vaporization: liq → gas. ← liquid to gas.
- Condensation: gas → liq. ← gas to liquid.
- Water vapor not vis. ← visible.
  - Condense to see.
- Vapor cone when aircraft brk spd. snd.
  - when did the first vapor cone occur? when flying.
  - breaks speed of sound.
  - ~~1,235 Km/ph~~ Km/ph = Kilometers per hour.
  - Mach 1.0.
    - Who found out this was the speed of sound?
  - Spd. snd. ← speed of sound.
  - Jet 725 ~~Km/ph~~ Km/ph
- Subsonic pressure waves not too compr.
- ★ Shock waves air compress.
  - Compresses.
  - Compressed.

Phase changes

Aircrafts Vapor Cone Details

I previously learned about these concepts in depth.

I never knew the speed of sound!

11/10/26

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# Phase Changes Notes.

What did I mean?!?

Vapor Cone

- Exp. fan + shock wv. ← wave create Vap. ← vapor cone.
- Rap. ← rapid press ← pressure drop + rap. ← rapid temp. ← temperature drop.
- In. press. in temp. de. press. de. temp.
- Higher humm. btr vis. vapor cone.
  - Sonic boom.

↑ : increase in pressure
+ : increase in temperature
The higher the humidity, the better visibility for vapor cone.
↓ : decrease in pressure
+ decrease in temperature

- At sea level water boils 100°C.

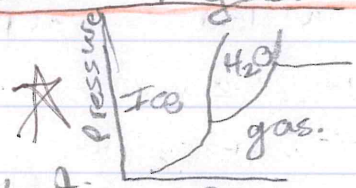
★ Water can be vapor, ice, and liquid.

★ Pressure affects phase.

- Water boils at lower temp. in higher pressure.

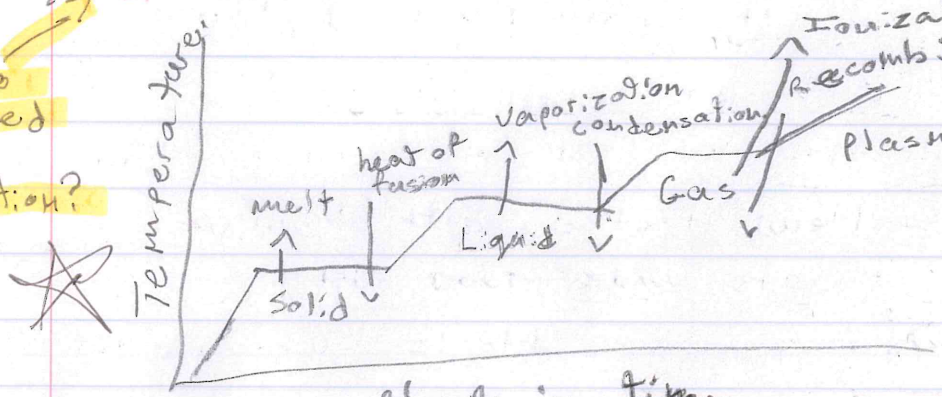
I didn't know that!

★ You can go from solid → gas.
  - Dry ice.




★ Solid → gas is ablation.

Who named it ablation?




- Plasma behaves like gas.
  - But flying e⁻, electrons.
  - When plasma cools, e⁻ reattach to atoms.

I learned about ionization last year.

11/10/26.
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Notes for Lab:

- Heat of fusion accepted value for ice is 334 $\frac{\text{joules}}{\text{gram}}$
- Percent error: $\left|\frac{\text{your answer} - \text{correct}}{\text{correct}}\right| \cdot 100$ ← absolute value.