Vapor Pressure (~) represents how much vapor is present.

 having

\[ \text{v.p. is } f(\text{Temp}) \]

\[ \text{760 mm} \]

\[ \text{"manometer"} \]

\[ \text{Hg} \]

\[ \text{20°C} \]

\[ \text{90°C} \]

(460 mm=30 ft high)

- **Boiling**: v.p. = atmospheric

- **High Altitude**: boils lower in Denver -> Mac & Cheese recipe

- **High Pressure**: cook faster @ higher pressure -> higher temp

- **Wattled Pot**

\[ \text{Temp} \]

\[ \text{100°C} \]

\[ \text{constant temp} \]

\[ \text{time} \]

longer \( \uparrow \) \( H \)

\( \uparrow \) more fluid
Critical Temperature & Pressure

- If your pressure cooker doesn't fail, you can neglect a critical point: $T_c, P_c$

Vapor Pressure is non-linear with temp

\[ P_{(\text{sat})} \]

\[ T(\text{C}) \]

instead use this: $\ln P = -A \left( \frac{1}{T} \right) + B$

Spreadsheet:

- slope $(-A)$
- $A = \frac{\Delta H_{\text{mp}}}{R}$

With two points, we can calculate the line

"Clusius-Clapeyron eqn:

\[ \ln \frac{P}{P_1} = \frac{\Delta H_{\text{mp}}}{R} \left( \frac{1}{T_1} - \frac{1}{T} \right) \]
Solid → fusion
(when a fuse blows, the metal wire gets too hot and melted, then broke)

Solid → Liquid
Freezing

Solid + Liquid

\( \Delta H_f \) = heat of fusion

Add super cooling dip
→ why does it get warmer?

Sublimation: solid → vapor

\( \Delta H_{sub} = \Delta H_{fus} + \Delta H_{vap} \)
Ex.

Melting Point Device

Glass Tube

Thermocouple

32°C

To calibrate Armand had to:

- purify compound "Benzoin"
- put it in the tube
- melt it & record temp

But benzoin did this

Dry, shiny crystals

Wet crystals

Liquid

T < Tm

T = Tm

T > Tm

→ evaporated & condensed up higher → all gone