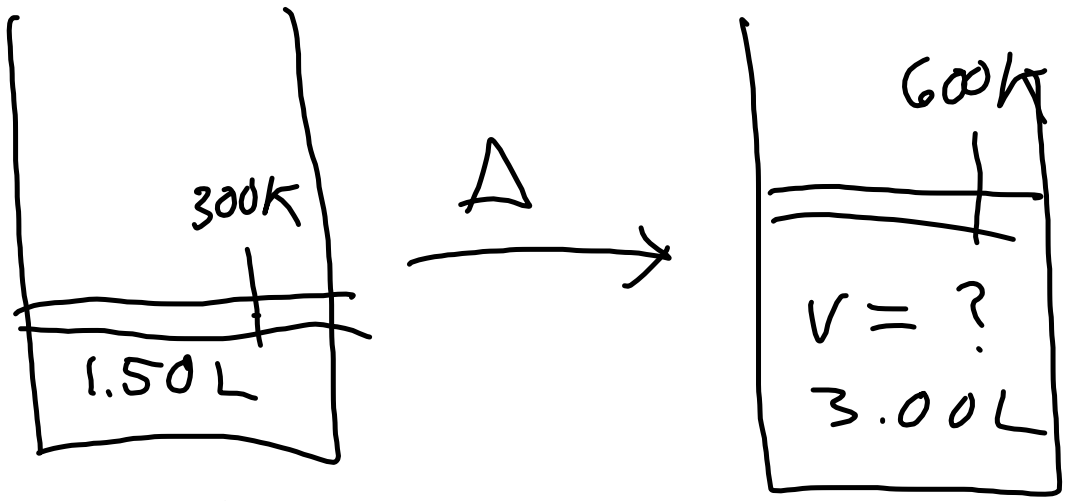
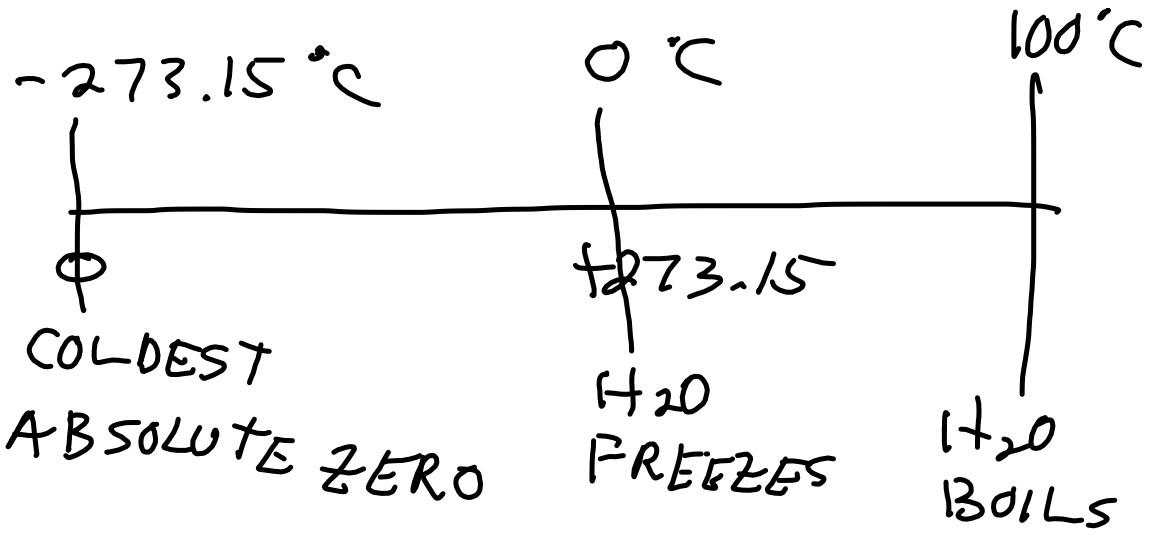
Topics Covered

1. Reaction types
   - Combination
   - Decomposition
   - Single Replacement
   - Double Replacement
   - Combustion
2. Reactions in solution
   - Molecular Equations
   - Ionic Equations
   - Spectator Ions
   - Net Ionic Equations
   - Predicting precipitate formation
   - Acid/Base Neutralization
3. Gases



$V \propto T$ Charles' Law

$K = °C + 273.15$



$°C = K - 273.15$

$V \propto T$ Charles' Law

For a fixed amount of gas at a constant pressure, the volume is directly proportional to the kelvin temperature.

$$V = k \cdot T \qquad k = f(P, n)$$

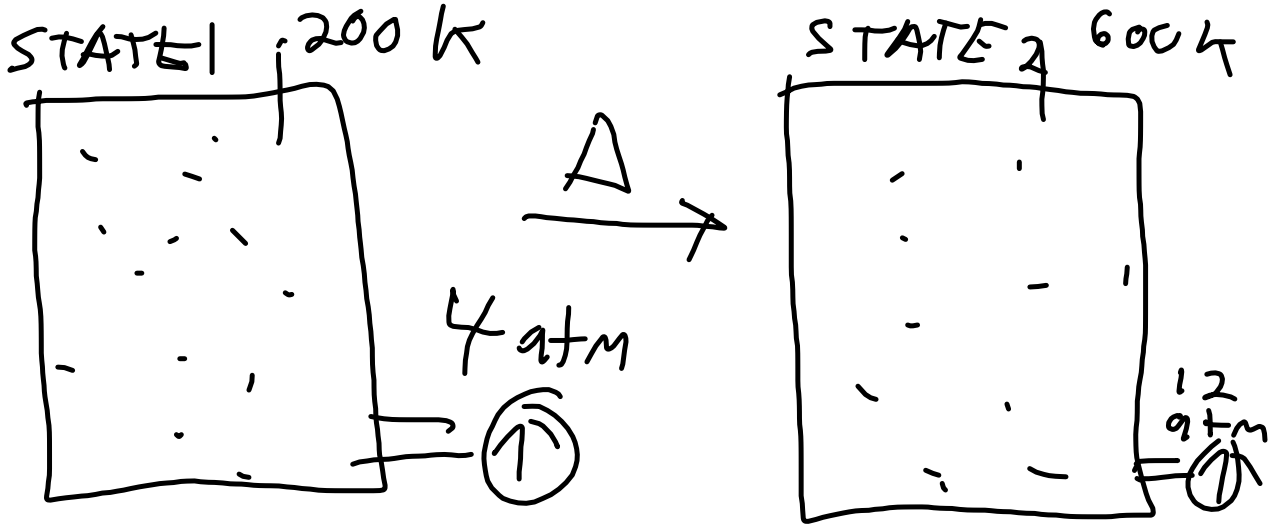
STATE 1 $\frac{V}{T} = k$ STATE 2

$$\frac{V_1}{T_1} = k \qquad \frac{V_2}{T_2} = k$$

$$\frac{V_1}{T_1} = \frac{V_2}{T_2}$$

Applies to an isobaric process, involving a fixed amount of gas.

2-point form of Charles' Law



$P \propto T$ Gay-Lussac's Law

Amonton's Law

$P = K \cdot T \quad K = f(V, n)$

$\frac{P}{T} = K$

$\frac{P_1}{T_1} = K \qquad \frac{P_2}{T_2} = K$

$$\frac{P_1}{T_1} = \frac{P_2}{T_2}$$

2-Point form of Gay-Lussac's Law

Applies to an isochoric process involving a fixed amount of gas.

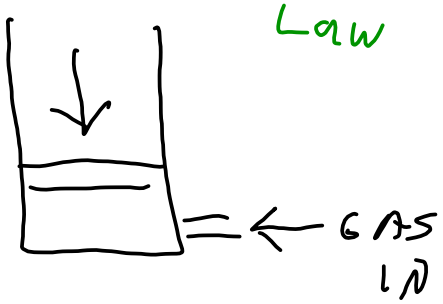
Law	2-point Equation	what must be constant
Boyle's Law	$P_1 V_1 = P_2 V_2$	T (isothermal) ∩
Charles' Law	$\frac{V_1}{T_1} = \frac{V_2}{T_2}$	P (isobaric) ∩
Gay-Lussac's Law (Amonton's Law)	$\frac{P_1}{T_1} = \frac{P_2}{T_2}$	V (isochoric) ∩
combined gas law	$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$	∩

$V \propto \frac{1}{P}$ Boyle's Law

$V \propto T$ Charles' Law

$V \propto n$ ~ Avogadro's Law

~~$V \propto \frac{1}{n}$~~



$V \propto \frac{1}{P} \cdot T \cdot n$

$V = R \cdot \frac{1}{P} \cdot T \cdot n$

$PV = R \cdot T \cdot n$

$\boxed{PV = nRT}$ Ideal Gas Law

$R = \frac{PV}{nT} = 0.08206 \frac{L\,atm}{K\,mol}$

Gas constant