

Barometer - Torricelli (Torr)  
(mmHg)

↳ Measure ATMOSPHERIC Pressure



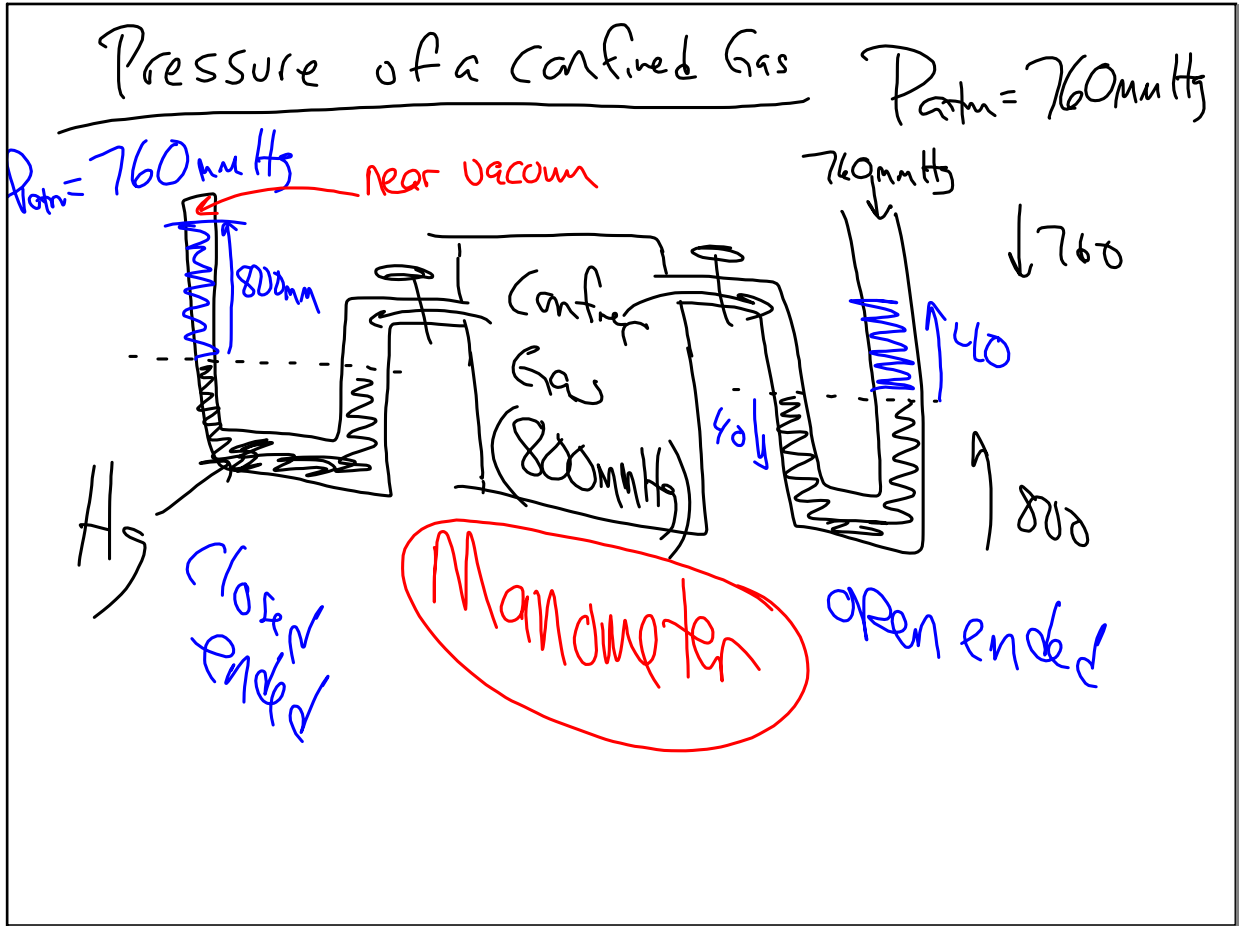
Dec 2-7:44 AM

Conversion  
Std. Pressure

$$760 \text{ Torr} = 1 \text{ atm} = 101.35 \text{ kPa}$$

$$760 \text{ mmHg} = 1 \text{ atm} = 101.35 \text{ kPa}$$

Dec 2-8:09 AM



Dec 2-8:13 AM

### Gases

	Pressure	Volume	Temperature
① Boyle's Law P and V ↳ indirect/inverse	V is constant	↓ V then ↑ P	
			$P \times V = \text{constant}$
② Gay-Lussac's Law P and T ↳ Direct	V is constant	↑ T then ↑ P	
			$\frac{P}{T} = \text{constant}$
③ Charles's Law V and T ↳ Direct	P is constant	↑ T then ↑ V	
			$\frac{V}{T} = \text{constant}$

#### COMBINED GAS LAW

$$\frac{PV}{T} = \text{constant}$$

Dec 2-8:22 AM

Changes in Conditions

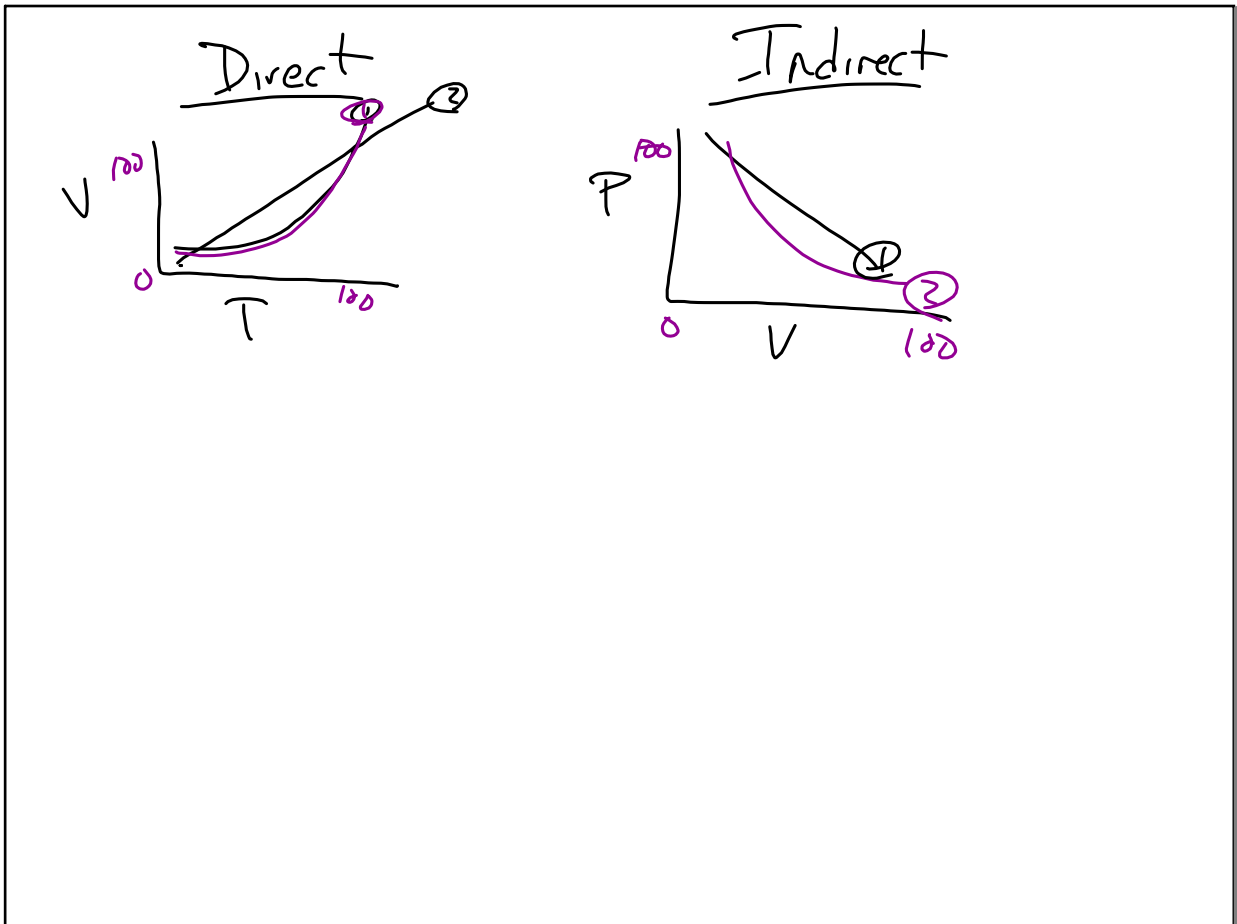
$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

(initial)
(Final)

Can't have ~~Q~~

Temp MUST BE KEPT CONSTANT

Dec 2-8:46 AM



Dec 2-8:49 AM

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$K = ^\circ C + 273$

$$\frac{252 (1) (6)}{0.47 \cdot 295} = \frac{(\cancel{0.45}) (V)}{\cancel{252}}$$

$\frac{252}{\cancel{0.45}}$

$V = 11.39 \text{ L}$

Dec 2-8:54 AM

Regits Chem

1 Mole of ANY GAS = 22.4 L

\* AT STP ONLY

$\uparrow$  273K  
 $\uparrow$  0°C  
 $\uparrow$  1 atm 760 mmHg  
 $\uparrow$  101.35 kPa

Dec 2-8:57 AM

Ideal Gas EQN

$$PV = nRT$$

← Temp. KELVIN  
K

Pressure ATM      Volume L      # of Mols Moles      Universal Gas Constant

$R = 0.08206 \frac{\text{l} \cdot \text{atm}}{\text{Mole} \cdot \text{K}}$

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$$\frac{PV}{nT} = \frac{nRT}{nT}$$

$$R = \frac{PV}{nT} = \frac{\text{l} * \text{atm}}{\text{Mole} * \text{K}}$$

Dec 2-8:58 AM

$$\text{CaCO}_3 (s) \rightarrow \text{CaO} (s) + \text{CO}_2 (g)$$

How many mols of  $\text{CO}_2 (g)$  are given off

$V = 250 \text{ ml flask}$   
 $P = 1.3 \text{ atm}$   
 $T = 31^\circ \text{C}$

$$PV = nRT$$

$$(1.3)(0.25) = n(0.08206)(304)$$

$$n = 0.013 \text{ mols } \text{CO}_2 * \frac{44 \text{ g } \text{CO}_2}{1 \text{ mole } \text{CO}_2} = 0.57 \text{ g } \text{CO}_2$$

Dec 2-9:03 AM

Density of a Gas =  $\frac{\text{mass}}{\text{Volume}} = \frac{g}{l} \left[ \frac{g}{V} \right]$

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$PV = nRT$

$\frac{PV}{1} = \frac{gRT}{mw}$

$\frac{P(mw)}{1} = \frac{gRT}{V}$

$\frac{P(mw)}{RT} = \frac{g}{V}$

$D = \frac{g}{V} = \frac{P(mw)}{RT}$

Density of a Gas

Dec 2-9:09 AM

Molarity of soln  $\frac{M}{l} = \frac{\text{moles}}{l} \left[ \frac{n}{V} \right]$

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$PV = nRT$

$\frac{P}{RT} = \frac{n}{V} = \text{Molarity}$

Dec 2-9:12 AM

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

$$PV = nRT$$

Kelvin

$$\text{density} = \frac{P(\text{mw})}{RT}$$

$$M = \frac{P}{RT}$$

Dec 2-9:14 AM

10 / 24, 38, 50 a

Molec. from LAB

Dec 2-9:16 AM