TH-GC General Chemistry Week 24 3/16

$F = ART$

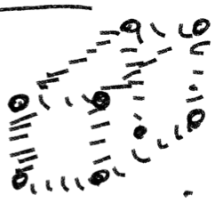
R = universal gas constant

$8.314 \frac{atm \cdot L}{mol \cdot K}$

Ideal Gas

Gas particles so far apart they do not affect each other.

solid



- particles in fixed position.
- vibrational movement, no translational movement.
- dense

heat → melt

Liquid

- particles farther apart – but still have bond energy, still influence each other
- vibrational & translational movement
- less dense
- takes shape of container

heat → vaporize

Gas

ideal

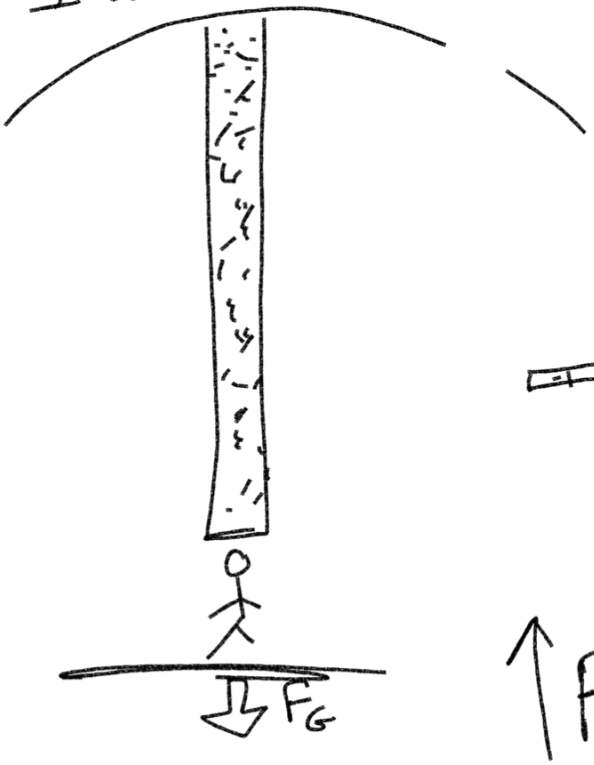
- particles so far apart do not influence each other.
- vibrational & a lot of translational movement
- least dense

Ideal Gas Law

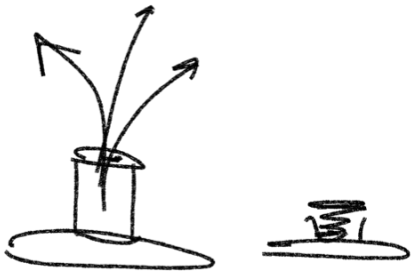
$$PV = nRT$$

- P ← pressure
  - atm
  - atmosphere
  - STP - standard temperature and pressure
- V ← volume (L)
- n ← # of mole (amount) (mol)
- R ← universal gas constant
  - $8.314 \frac{atm \cdot L}{mol \cdot K}$
- T ← Absolute temperature (K)

1 atm = 760 torr = 760 mmHg = 101.1 kPa

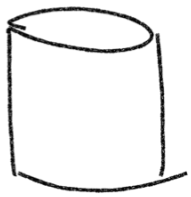


$\uparrow PV = nRT$ (fixed)



$\uparrow PV\downarrow = nRT$

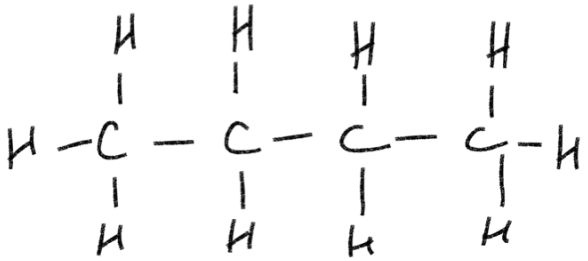
$P V\downarrow = n R T\downarrow$



held pressure constant
amount constant

decreased volume

temperature? decreased



butane

STP ↑↑

1 atm

25°C

25
+ 273
298 K

Gases @ stp

O_2, N_2, CO_2, He, Kr, Xe, Ar, Ne
(noble gas)

Cl_2

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$