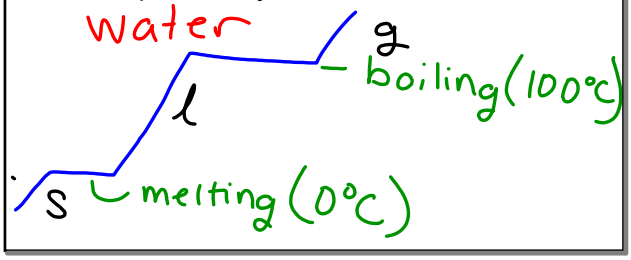
BR: January 16th

1. Compare your graph with your partner and discuss where the melting and boiling points are. Also discuss any other questions you have.



Jan 23-8:52 AM

Wednesday January 15 th

Objective: Determine the properties that are unique to gases.

1. Bellringer
2. Properties of Gases Notes
3. Properties of Gases HW

DUE: Phases of Matter & KMT
HW: Properties of Gases HW

Jan 21-8:46 AM

TEMPERATURE CONVERSIONS

Temperature (T) must be in units of Kelvin (K) for all gas law calculations.

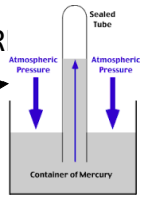
* K = C + 273
  - example: 25 C = 298 K

- C = K - 273
  - example: 305 K = 32 C

Jan 26-7:50 AM

GAS PRESSURE

- Pressure = force/area and comes from particle collisions
- COLLISIONS CAUSE PRESSUR
- Barometer: used to measure air pressure



- Increase in air pressure = Hg rises
- Force of gas on the surface of mercury

Jan 26-7:50 AM

UNITS OF PRESSURE

- Pascal (SI unit):
  - Pascal = 1 N/m^2 1,000 Pa = 1 kPa
- Parts per square inch (PSI)
- millimeters of Mercury (mm Hg)
- 1 mm Hg = Torr (1 torr)
- 1 Atmosphere (atm) = 760 mm Hg = 101.3 kPa

Jan 26-7:50 AM

Standard Temperature and Pressure (STP)

P = 760 mm Hg or 1 atm or 101.3 kPa

T = 273K or 0 °C

Jan 24-6:54 AM

CONVERTING UNITS OFPRESSURE

1. Convert 1.5 atm to kPa.

$1.5\ atm \times \frac{101.3\ kPa}{1\ atm} = 151.95\ kPa$

2. Convert 755 mmHg to atm.

$755\ mmHg \times \frac{1\ atm}{760\ mmHg} = .993\ atm$

3. Convert 98.5 kPa to mmHg.

$98.5\ kPa \times \frac{760\ mmHg}{101.3\ kPa} = 738.99\ mmHg$

Jan 26-7:50 AM

Dalton's Law of PARTIAL PRESSURES

- In a mixture of gases, each gas exerts pressure independent of the others.
- Total pressure is the sum of all the parts.
- $P_{total} = P_1 + P_2 + P_3 + P_4 + P_5 \ldots$ (O_2, CO_2, N_2)
- When working the formula, replace the subscripts with the formula for the gas

Jan 26-7:50 AM

PRACTICE PROBLEMS:

1. What is the partial pressure of hydrogen (H_2) gas in a mixture of hydrogen and helium if the total pressure is 600 mm Hg, and the partial pressure of Helium is 439 mm Hg?

$P_{H_2} + P_{He} = P_{total}$

$X + 439 = 600\ mmHg$

$-439 \quad -439$

$X = 161\ mmHg$

Jan 26-7:50 AM

PRACTICE PROBLEMS:

1. Find the total pressure of a mixture that contains 4 gases with partial pressures of 5.00 kPa, 4.56 kPa, 3.02 kPa and 1.20 kPa.

13.78 KPa

Jan 26-7:50 AM

Check for Understanding

Find the partial pressure of carbon dioxide in a gas mixture with a total pressure of **17.8** atm. The partial pressure of the other gas in the mixture is 2812 mmHg → atm

$2812\ mmHg \times \frac{1\ atm}{760\ mmHg} = 3.7\ atm$

$17.8 - 3.7 = 14.1\ atm$

$17.8\ atm \times \frac{760\ mmHg}{1\ atm} = 13{,}528\ mmHg$

760

Jan 16-9:41 AM

Worktime: Properties of Gases HW

Turn in: Phases of Matter and KMT activity

Phase Change Review:

1. a. Water Freezing

$water(l) - energy \rightarrow water(s)$

exo

Answer the following questions about gases:

2. Describe the behavior of gases (density, compression, expansion, diffusion, effusion)

Jan 23-8:55 AM