(#4-3a)

Why is a Gas a Gas?

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1. What are the factors or variables that affect gases?

   Pressure, Temp Volume

Temperature

2. In a simplified sense... what does temperature mean?

   - Speed of particles

3. What is another name for temperature?

   average Kinetic Energy

4. What happens to a gas particle as the temperature is raised?

   a. Convert 0C to kelvin. C+273= K (+273)

   b. To balloons at STP, Balloon A contains He and Balloon B contain CO2.

      Temp ↓

      i. Which has a higher average kinetic energy? - @ 0°C ← Both equal

      ii. Which has a higher molecular velocity?

      $KE = \frac{1}{2} m v^2$ ↓ ↑ Need lowest mass (He)

Pressure

5. As particles move around inside of a container, what produces pressure?

   - Coll. S.O.D/area with inside wall of container

6. What is are two typical units of pressure

   ATM + mm Hg

7. A ridged container contains 1 liter of gas. The gas is heated from 10C to 20 C.

   a. What is happening to the speed of the particles? ↑
   b. What is happening to the number of collisions per area? ↑
   c. What happens to the pressure? ↑

Volume

8. A gas is inside of 1 liter piston, the volume of the piston is shrunk by ½ at a constant temperature.

   a. What is happening to the speed of the particles? - same
   b. What is happening to the number of collisions per area? ↑

9. What is happens to the pressure? ↑
10. What is the difference between an ideal gas and a non-ideal gas. Use the kinetic molecular theory to justify.

    ideal gas - No interaction between Particles.

Three separate containers all rigid and have a volume of 2.24L.

Sample	Element	Temperature	Pressure	Mass	moles
A	O_2	273	1 atm	3.2g	0.1
B	O_2	273	2 atm	6.4	0.2
C	Ne	273	1 atm	2.0	0.1

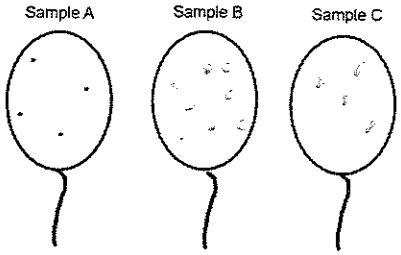
11. Which of the containers has the highest average kinetic energy?

all equal

12. Which of the containers has the highest molecular velocity?

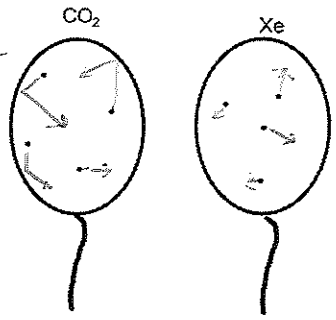
C

13. Add particles for sample B and C to accurately describe their pressures.



14. Here are two balloons at the same temperature at the same pressure, draw vectors on the particles representing their speeds.

on average, longer lines for CO_2



15. Student hypothesis: All the gas particles in a balloon are traveling the same speed, as long as they are the same weight.

Nullify, it is an average speed.

15. As a football at Lambeau field is pumped up inside then brought outside during a very cold game. Using principles of the kinetic molecular theory, describe what happens to the football.

Colder air, moves slower, causing less collisions reducing pressure of balloon

16. A potato chip manufacture only fills their bags half full of air, so they do not pop. Using principles of the kinetic molecular theory, describe what conditions could cause the bags of chips to pop?

a. ↑ Temp, more collisions due to faster moving particles

b. lower pressure, outside the bags (in an airplane) causing bags to expand to match that pressure