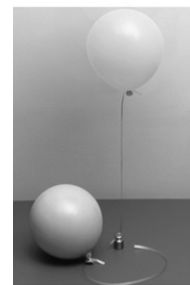


Name: _____

Gas Laws Assessment

1. The figure shows two balloons, one contains hydrogen gas (H_2) and the other carbon dioxide (CO_2). They are at the same temperature and contain equal volumes of gas, but one is floating, and the other is not.



Identify each of the following statement as true or false.

- | | | |
|---|------|-------|
| a) The two balloons have the same pressure. | True | False |
| b) The two balloons contain the same number of molecules. | True | False |
| c) The two balloons contain the same mass. | True | False |

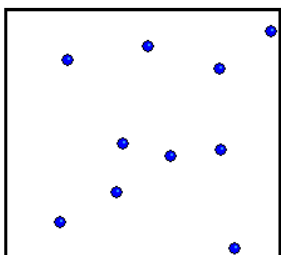
Use your answers to the above to explain why one is floating and the other is on the table.

- d) Separately, what can you conclude about the relative speed of the gas particles in the two balloons?

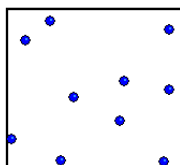
☐ H_2 moves faster ☐ CO_2 moves faster ☐ Both gases move at the same speed

2. In the following 2-D illustrations, assume that the gas molecules are in motion and that if there is a larger box it indicates a larger volume for the container holding the molecules.

Box A: 10 molecules



Box B: 10 molecules



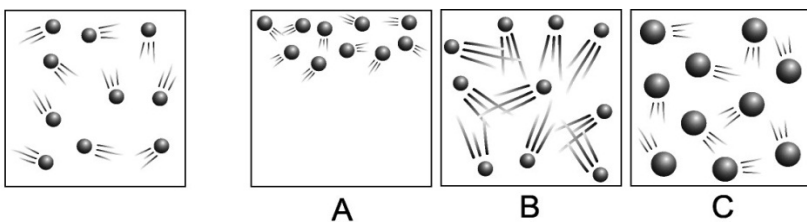
If both gas samples are at the same pressure:

- A. the sample in box B has the highest temperature.
- B. the sample in box A has the highest temperature.
- C. both samples are at the same temperature.
- D. it is not possible to say anything about the relative temperature.

Please turn over the page

Name: _____

3. The diagram below shows the moving particles of a gaseous material within a rigid container. Which of the three boxes on the right best represents this material upon the addition of heat? (circle one)



Explain why you chose that answer.

4. You open up two bottles, one of $\text{H}_2\text{S}(\text{g})$ (MW = 34.08 g/mol) and the other of $\text{NH}_3(\text{g})$ (MW = 17.04 g/mol). Your lab partner is standing across the room. Which does she smell first?

Circle one: H_2S NH_3

Knowing that if both gases are at the same temperature they will have the same average kinetic energy, explain your choice.

5. A weather balloon filled with helium gas gets larger as it ascends to high altitudes. Use **particle motion** to explain why this occurs. [Hint: think about the fact that the balloon is separating two gases, one on the outside and one on the inside.]