

Avogadro's Law

1. The table below shows mass and volume data for four samples of substances at 298 K and 1 atm. Which two samples could consist of the same substance?

- A) *A* and *B* C) *A* and *C*
 B) *B* and *C* D) *C* and *D*

Masses and Volumes of Four Samples

Sample	Mass (g)	Volume (mL)
A	30.	60.
B	40.	50.
C	15	90.
D	90.	120.

2. A sample of oxygen gas is sealed in container X. A sample of hydrogen gas is sealed in container Z. Both samples have the same volume, temperature, and pressure. Which statement is true?
 A) Container X contains more gas molecules than container Z.
 B) Container X contains fewer gas molecules than container Z.
 C) Containers X and Z both contain the same number of gas molecules.
 D) Containers X and Z both contain the same mass of gas.
3. At the same temperature and pressure, 1.0 liter of CO(g) and 1.0 liter of CO₂ (g) have
 A) equal masses and the same number of molecules
 B) different masses and a different number of molecules
 C) equal volumes and the same number of molecules
 D) different volumes and a different number of molecules

4. Each stoppered flask to the right contains 2 liters of a gas at STP. Each gas sample has the same

- A) density C) number of molecules
 B) mass D) number of atoms



5. A sample of H₂(g) and a sample of N₂ (g) at STP contain the same number of molecules. Each sample must have
 A) the same volume, but a different mass C) both the same volume and the same mass
 B) the same mass, but a different volume D) neither the same volume nor the same mass

Graham's Law

1. At STP, which gas diffuses at the faster rate?
 A) H₂ B) N₂ C) CO₂ D) NH₃
2. Which gas diffuses most rapidly at STP?
 A) Ne B) Ar C) Cl₂ D) F₂

3. Under the same conditions of temperature and pressure, which gas will diffuse at the *slowest* rate?
A) He B) Ne C) Ar D) Rn
4. Which of the following gases would have the *slowest* rate of diffusion when all of the gases are held at the same temperature and pressure?
A) N₂ B) NO C) O₂ D) CO₂
5. Which gas would diffuse most rapidly under the same conditions of temperature and pressure?
A) gas A, molecular mass = 4 C) gas B, molecular mass = 16
B) gas C, molecular mass = 36 D) gas D, molecular mass = 49

Dalton's Law

1. What is the pressure of a mixture of CO₂, SO₂, and H₂O gases, if each gas has a partial pressure of 25 kPa?
A) 25 kPa B) 50 kPa C) 75 kPa D) 101 kPa
2. A flask contains a mixture of N₂ (g) and O₂ (g) at STP. If the partial pressure exerted by the N₂(g) is 40.0 kPa, the partial pressure of the O₂ (g) is
A) 21.3 kPa B) 37.3 kPa C) 61.3 kPa D) 720 kPa
3. The partial pressures of gases A, B and C in a mixture are 0.750 atmosphere, 0.250 atmosphere and 1.25 atmospheres, respectively. What is the total pressure of the gas mixture in kPa?
A) 2.25 kPa B) 202 kPa C) 228 kPa D) 301 kPa
4. A cylinder is filled with 2.00 moles of nitrogen, 3.00 moles of argon and 5.00 moles of helium. If the gas mixture is at STP, what is the partial pressure of just argon?
A) 20.3 kPa B) 30.4 kPa C) 50.7 kPa D) 101 kPa
5. A mixture of gases has a total pressure of 1.97 atm. The mixture contains 8 moles of nitrogen gas and 2 moles of oxygen gas. What pressure is exerted by the oxygen gas molecules?
A) 0.197 atm B) 0.394 atm C) 0.494 atm D) 1.58 atm