**Reading a Gas Mixture After a Small Leak**

Base your answers on the information provided and your knowledge of chemistry. Use the 2025 Chemistry Reference Tables as needed.

A rigid chamber holds two gases at one temperature. P particles are lighter than Q particles and move faster on average in the model. A tiny opening lets particles escape into an evacuated collector. No gas returns during the observation. The faster species loses a larger fraction of its particles over the observation, and the chamber temperature is unchanged.

| Gas | Particle count before the leak | Particle count after the leak |
|---|---|---|
| P | 40 | 20 |
| Q | 40 | 30 |

**1** Which gas loses the greater fraction of its original particles?

(1) P only

(2) Q only

(3) Both lose the same fraction.

(4) The starting counts cannot be compared.

**2** Calculate the fraction of the remaining gas particles that are Q. Compare it with the starting fraction. [1]

Answer and work

**3** A student says Q’s greater fraction means more Q particles entered the chamber. Evaluate the claim using the counts. [1]

Answer and work

At the stated temperature and volume, the pressure is proportional to the total particle count. The starting pressure is 80 kPa.

**4** Find the final pressure and explain why the composition change alone does not give that pressure. [1]

Answer and work