

Problem Set - The Mole and Gas Volume

Q1. Calculate the volume occupied by 5 moles of oxygen gas (O_2) at:

- a) STP
- b) RTP

Q2. Find the number of moles, molecules, and volume of hydrogen gas (H_2) in 4 g at RTP.

Q3. Determine the mass of carbon dioxide gas (CO_2) contained in 11.2 L at STP.

Q4. How many molecules are present in 33.6 L of nitrogen gas (N_2) at STP?

Q5. A sample of methane (CH_4) has a mass of 8 g. Calculate:

- a) The number of moles
- b) The volume at RTP
- c) The number of molecules

Q6. At STP, 44.8 L of an unknown gas has a mass of 64 g. Calculate the molar mass of the gas and identify it.

Q7. A cylinder contains 0.5 mol of helium gas. Calculate its volume at:

- a) STP
- b) RTP