1. What are the four basic assumptions of the kinetic molecular theory of gases?

2. Calculate the root-mean-square speed of molecular chlorine in m/s at 20°C

3. The temperature in the stratosphere is −23°C. Calculate the root-mean-square speeds (in m/s) of N₂, O₂, and O₃ molecules in this region.

4. It takes 192 s for an unknown gas to effuse through a porous wall and 84 s for the same volume of N₂ gas to effuse at the same temperature and pressure. What is the molar mass of the unknown gas?

5. If one mole each of He and Cl₂ gases are compared at STP, which of the following quantities will be equal to each other? (a) root-mean-square speed (b) effusion rate (c) average kinetic energy (d) volume

6. Nickel forms a gaseous compound of the formula Ni(CO)ₓ. What is the value of x given the fact that under the same conditions of temperature and pressure, methane (CH₄) effuses 3.3 times faster than the compound?