SAINIK SCHOOL GOPALGANJ

CLASS-11

STATES OF MATTER ASSIGNMENT

1. A container with a pin-hole contains equal moles of $H_{2(g)}$ and $O_{2(g)}$. Find the fraction of oxygen gas escaped at the same time when one-fourth of hydrogen gas escapes

(a) 1/16

(b) 1/4

(c) 1/2

(d) 1/8

2. What are the conditions for gas like Carbon monoxide to obey the ideal gas laws?

(a) low temperature and low pressure

(b) low temperature and high pressure

(c) high temperature and low pressure

(d) high temperature and high pressure

3. If the temperature is doubled, the average velocity of a gaseous molecule increases by

(a) 4

(b) 1.4

(c) 2

(d) 2.8

4. Find the molecular mass of a gas that takes three times more time to effuse as compared to He with the same volume

(a) 9 u

(b) 64 u

(c) 27 u

(d) 36 u

5. At the same temperature, the average molar kinetic energy of N_2 and CO is

(a) $KE_1 > KE_2$

(b) $KE_1 < KE_2$

(c) $KE_1 = KE_2$

(d) insufficient information given

6. Find the temperature at which the rate of effusion of N_2 is 1.625 times to that of SO_2 at 500℃

(a) 620℃

(b) 173℃

(c) 110℃

(d) 373℃

7. Find the change in the root mean square speed of the gas on raising the temperature from 27℃ to 927℃

(a) becomes times

(b) gets doubled

(c) gets halved

(d) remains same

8. The product of pressure and volume of a definite amount of gas remains constant at constant temperature. This is the statement of –

(a) Boyle's law

(b) Charles' law

(c) Avogadro's law

(d) Gay Lusac's law

9. If 1.204×10^{21} molecules of H_2SO_4 are removed from 392 mg of H_2SO_4, find the moles of H_2SO_4 left.

(a) 4×10^{-3}

(b) 1.5×10^{-3}

(c) 1.2×10^{-3}

(d) 2×10^{-3}

10. Find the fraction of the total pressure exerted by hydrogen if it is mixed with ethane in an empty container at 25℃

(a) 15/16

(b) 1/16

(c) 1/2

(d) 1

SA type

11.. If 1 gram of each of the following gases are taken at STP, which of the gases will occupy (a) greatest volume and (b) smallest volume? CO, H_2O, CH_4, NO

12.Physical properties of ice, water and steam are very different. What is the chemical composition of water in all the three states.

13.Behaviour of matter in different states is governed by various physical laws. According to you what are the factors that determine the state of matter?

14. What will be the molar volume of nitrogen and argon at 273.15K and 1 atm?

15.A gas that follows Boyle's law, Charle's law and Avogadro's law is called an ideal gas. Under what conditions a real gas would behave ideally?

LA type

16.Two different gases 'A' and 'B' are filled in separate containers of equal capacity under the same conditions of temperature and pressure. On increasing the pressure slightly the gas 'A' liquefies but gas B does not liquify even on applying high pressure until it is cooled. Explain this phenomenon. What do you mean by Critical pressure, Critical volume and Critical temperature?

17. Name two intermolecular forces that exist between HF molecules in liquid state.

18.One of the assumptions of kinetic theory of gases is that there is no force of attraction between the molecules of a gas.
State and explain the evidence that shows that the assumption is not applicable for real gases.

19. The variation of pressure with volume of the gas at different temperatures can be graphically represented as shown in Fig. 5.3.
On the basis of this graph answer the following questions.

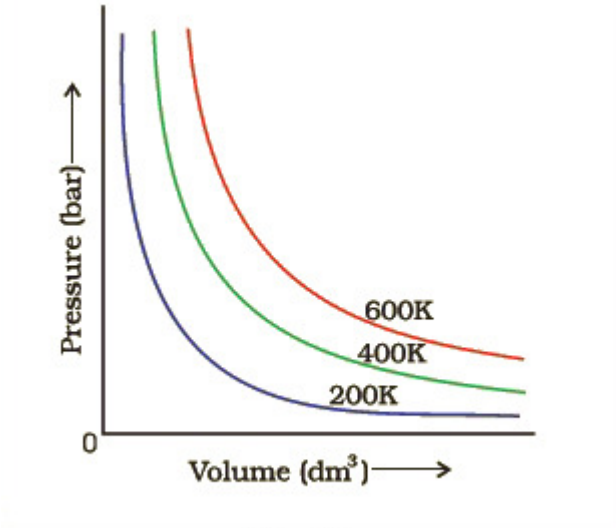

Fig. 5.3

(i) How will the volume of a gas change if its pressure is increased at constant temperature?

(ii) At a constant pressure, how will the volume of a gas change if the temperature is increased from 200K to 400K?

20.Pressure versus volume graph for a real gas and an ideal gas are shown in Fig. 5.4. Answer the following questions on the basis of this graph.

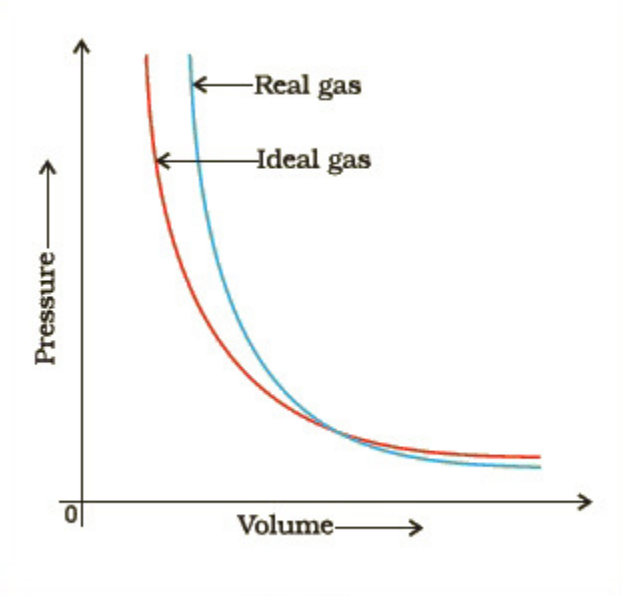

Fig. 5.4

- (i) Interpret the behaviour of real gas with respect to ideal gas at low pressure.
- (ii) Interpret the behaviour of real gas with respect to ideal gas at high pressure.
- (iii) Mark the pressure and volume by drawing a line at the point where real gas behaves as an ideal gas.