



Multiple Choice Questions:

- Absolute zero is
a) 273°C b) -273°C c) 273K d) -273K
- Internal resistance of a liquid to flow is
a) Surface tension b) viscosity c) capillary action d) aqueous tension
- Which property of water can be used to explain spherical shape of rain droplets
a) Surface tension b) viscosity c) capillary action d) aqueous tension

Assertion[A] & Reasoning[R]

(A) Both assertion and reason are correct statements, and the reason is the correct explanation of the assertion

(B) Both assertion and reason are correct statements, but reason is not the correct explanation of the assertion

(C) Assertion is correct, but reason is wrong statement

(D) Assertion is wrong, but reason is correct statement

(E) Both assertion and reason are wrong statements

- [A]: Surface tension of a liquid decreases with increase in temperature
[R]: At higher temperature interparticle forces are greater.
- [A]: Three states of matter are the result of balance between intermolecular forces and thermal energy of the molecules
[R]: Intermolecular forces tend to keep the molecules together but thermal energy tends to keep the molecules apart
- [A]: Boiling point of a liquid cannot be altered by changing the pressure over the liquid.
[R]: Higher the pressure over the liquid, lower the boiling point.

Answer the following questions:

- What type of intermolecular forces exists between the following?
HCl and H_2O ii F_2 molecule iii Br^- and H_2O iv CO_2 and ammonia
- At a certain temperature, a certain mass of gas occupies a volume of 5dm^3 when the pressure is 540mm of Hg. Calculate the pressure in atmosphere when the volume is reduced to 1.5dm^3 at the same temperature.
- At a constant temperature, a certain mass of gas occupies 7.5L when the pressure is 800mm of Hg. Calculate the pressure at which the volume of the gas would be decreased by 35% of its initial volume.
- The temperature of a given mass of air was reduced from 15°C to -15°C . If the initial volume of air was 100ml , what would be its new volume if pressure is maintained a constant?

- 5 Calculate the volume occupied by 0.5 moles of CO_2 at -25°C and 760mm pressure. [At STP volume is 22.7 L/mole]
- 6 The density of a gaseous oxide at 2 bar is the same as that of nitrogen gas measured at 5 bar at a given temperature. Find the molar mass of the oxide.
- 7 What will be the pressure of a gaseous mixture containing 4.2 g of nitrogen and 1.6 g of methane in a 5 L flask at 27°C ?
- 8 The density of a gas was found to be 1.56g/Lat 745mm of Hg and 65°C . Calculate its molecular mass.
- 9 Using the equation of state $PV = nRT$ show that at a given temperature, the density of a gas is proportional to pressure.
- 10 Derive
 - a) The relation between partial pressure of a gas and its mole fraction.
 - b) The ideal gas equation
 - c) Relation between density of a gas and its molar mass
- 11
 - a) In terms of Charles laws explain why -273°C is lowest possible temperature?
 - b) Explain the term absolute zero.
- 12
 - a) What do you understand by critical temperature, critical pressure and critical volume of a gas?
 - b) Critical temperature for carbon dioxide and methane are 31.1°C and -81.9°C respectively. Which of these has stronger intermolecular forces and why?
- 13
 - a) What do you mean by ideal and real gases?
 - b) Why do real gases deviate from ideal behaviour?
 - c) Write Van der Waals equation for real gases.
 - d) Define Boyle's point.
- 14 Calculate the root mean square, average and most probable speeds of chlorine molecule at 27°C .