CHEMISTRY

BOOKS - CBSE COMPLEMENTARY MATERIAL CHEMISTRY (HINGLISH)

STATES OF MATTER : GASES, LIQUIDS AND SOLIDS

Mcq

1. Which of the following property of water can be used to explain the spherical shape of rain droplets ?

A. Viscosity

B. Critical phenomena

C. Surface tension

D. Pressure

Answer: C

Watch Video Solution

2. A gas behave most like an Ideal gas under conditions of

A. Low T and high P

B. High T and high P

C. Low T and low P

D. High T and low P

Answer: D

 Watch Video Solution

3. If P is the pressure and d is the density of gas, then P and d are related as :

A. $P\alpha 1/d$

B. $P\alpha d$

C. $P\alpha d^2$

D. $P\alpha 1/d^2$

Answer: B

Watch Video Solution

4. A gas can be liquefied

A. above its critical temperature

B. at its critical temperature

C. below its critical temperature

D. at any temperature

Answer: C

Watch Video Solution

5. Which of the following gas is expected to have highest value of Van der Waal's constant 'a'

A. NH_3

B. H_2

C. N_2

D. He

Answer: A

Watch Video Solution

6. The compressibility factor Z for an ideal gas will be .....

A. 1.5

B. 1.0

C. 2.0

D. zero

Answer: B

Watch Video Solution

7. Two separate bulbs contain ideal gas A and B. The density of a gas A is twice that of a gas B. The molecular mass of A is half that of gas B. The two gases are at the same temperature. The ratio of the pressure of A to that gas B is

A. 2

B. $1/2$

C. 4

D. $1/4$

Answer: C

Watch Video Solution

8. The volume of an ideal gas becomes zero at

A. $0^\circ C$

B. $273K$

C. $-273^\circ C$

D. $273^\circ C$

Answer: C

Watch Video Solution

9. Dominance of strong repulsive forces among the molecules of the gas ($Z =$ compressibility factor)

A. Depends of Z and indicates that Z=1

B. Depends of Z and indicates that $Z > 1$

C. Depends of Z and indicates that $Z < 1$

D. Is independent of Z

Answer: C

Watch Video Solution

10. Which of the following properties of liquid increases on increasing temperature :

A. Vapour pressure

B. Viscosity

C. Surface tension

D. Boiling point

Answer: A

Watch Video Solution

Fill In The Blanks

1. Pressure vs volume graph at constant temperature is known as.....

Watch Video Solution

2. Surface tension of a liquid.....with increase in magnitude of intermolecular forces.

Watch Video Solution

3. The temperature at which a real gas behaves like an ideal gas over an appreciable pressure range is called ..... .

Watch Video Solution

4. The average kinetic energy of gas molecules is directly proportional to the.....

View Text Solution

5. Internal resistance in flow of liquids is called.....

View Text Solution

6. .....is the temperature above which a gas cannot be liquefied however large the pressure may be.

View Text Solution

7. Poise is the unit of

Watch Video Solution

8. The vapour pressure of any liquid is..... proportional to the magnitude of the intermolecular forces and is.....proportional to the temperature employed.

Watch Video Solution

9. Van der Waal constant.....respresent co-volume and.....represent magnitude of attractive forces.

Watch Video Solution

True And False Type Questions

1. At high altitudes, water boils at a lower temperature because

Watch Video Solution

2. State whether the statement is true or false .Gases having $Z < 1$ cannot be liquefied easily.

Watch Video Solution

3. State whether the statement is true or false. According to the kinetic molecular theory, the collision between gas molecules is perfectly elastic.

Watch Video Solution

4. Real gases deviate from ideal behaviour at low temperature and high pressure.

View Text Solution

5. What is critical temperature? Can a gas be liquefied at any temperature by increasing its pressure?

Watch Video Solution

6. Mosquito cannot walk on kerosene oil because its surface tension is less than that of water.

View Text Solution

7. State whether the statement is true or false.

No gas is ideal gas, all gases are real gases.

Watch Video Solution

8. State whether the statement is true or false. Surface tension increases on increasing temperature.

Watch Video Solution

9. Predict whether the statement is true or false. $0^{\circ}C$ is known as absolute zero temperature.

Watch Video Solution

Match The Columns

1. Column-I Column-II

(i) Boyle's Law (a) $V \alpha n$ at constnt T & P

(ii) Charle's Law (b) $P_{\text{total}} = p_1 + p_2 + p_3 + \ldots\ldots\ldots$ at constant T & V

(iii) Dalton's Law (c) $V \alpha T$ at constant n & p

(iv) Avogadro Law (d) $p \alpha 1/V$ at constant n & P

Watch Video Solution

2. Column-I Column-II

(i) Critical temperature (a) Boiling point

(ii) Vapour pressure (b) Spherical shape of water droplet

(iii) Viscosity (c) Liquefaction of gases

(iv) Surface tension (d) Flow of liquids.

Watch Video Solution

Assertion And Reason Type Questions

1. Assertion (A) Gases do not liquefy above their critical temperature, even on applying high pressure.

Reason (R) Above critical temperature, the molecular speed is high and intermolecular attractions cannot hold the molecules together because they escape because of high speed.

A. A and R both are correct, and R is correct explanation of A.

B. A and R both are correct, but R is not correct explanation of A.

C. A is true but R is false.

D. A is false but R is true.

Answer: A

Watch Video Solution

2. Assertion : — At constant temperature PV vs V plot for real gas is not a straight line.

Reason : — At high pressure, all gases have

$Z > 1$ but at low pressure most gases have $Z < 1$

A. A and R both are correct, and R is correct explanation of A.

B. A and R both are correct, but R is not correct explanation of A.

C. A is true but R is false.

D. A is false but R is true.

Answer: B

Watch Video Solution

3. Assertion : At zero degree Kelvin, the volume occupied by a gas is negligible.

Reason : All molecular motion ceases at 0 K.

A. A and R both are correct, and R is correct explanation of A.

B. A and R both are correct, but R is not correct explanation of A.

C. A is true but R is false.

D. A is false but R is true.

Answer: C

View Text Solution

4. Assertion : CO_2 has stronger intermolecular forces than CH_4.

Reason : Critical temperature of CO_2 is more.

A. A and R both are correct, and R is correct explanation of A.

B. A and R both are correct, but R is not correct explanation of A.

C. A is true but R is false.

D. A is false but R is true.

Answer: A

Watch Video Solution

5. Assertion : Lower the cirtical temperature for a gas, more easily can it is liquefied.

Reason : Critical temperature is the temperature above which above which a gas

cannot liquefied depending upon the pressure.

A. A and R both are correct, and R is correct explanation of A.

B. A and R both are correct, but R is not correct explanation of A.

C. A is true but R is false.

D. A is false but R is true.

Answer: D

 Watch Video Solution

One Word Answer Type Questions

1. SI unit of pressure is

Watch Video Solution

2. Write the value of lowest possible temperature.

Watch Video Solution

3. The value of compressibility factor (Z) for an ideal gas is

Watch Video Solution

4. Write the unit of van der Waal constant which represent the magnitude of attractive forces between gas molecules.

Watch Video Solution

5. Name the gas law which relates volume and pressure of gas at constant temperature.

Watch Video Solution

6. Name the phenomenon responsible for the spherical shape of liquid drops.

Watch Video Solution

7. Name the property which opposes the flow of liquids.

Watch Video Solution

8. Two liquids A and B have vapour pressures 400 mm Hg and 450 mm Hg respectively at a given temperature. Which liquid has higher boiling point?

Watch Video Solution

9. Critical temperature of N_2 and O_2 are 126 K and 154.3 K respectively. Which gas has greater magnitude of attractive forces?

Watch Video Solution

10. Mention the volume occupied by one mole of an ideal gas at STP.

Watch Video Solution

1 Mark Questions

1. Define Dalton's law of partial pressure.

Watch Video Solution

2. State and explain Boyle's law. Represent the law graphically.

Watch Video Solution

3. Write van der Waal equation for n mol of gas.

Watch Video Solution

4. Write the conditions in terms of temperature and pressure under which gases deviate from ideal behaviour.

Watch Video Solution

5. Write the relation between pressure and density of gas.

Watch Video Solution

6. What is the relationship between average kinetic energy and the temperature of a gas ?

Watch Video Solution

7. Define the term absolute zero.

Watch Video Solution

8. In terms of Charles' law, explain why $-273^{\circ} C$ is the lowest possible temperature?

Watch Video Solution

9. What would be the SI unit for the quantity pV^2T^2/n?

Watch Video Solution

10. Define critical temperature.

Watch Video Solution

11. What is Boyle's temperature ?

Watch Video Solution

12. Define surface tension and angle of contact.

Watch Video Solution

13. What is the value of normal boiling point and standard boiling point of water?

Watch Video Solution

14. At a particular temperature vapour pressure of ethanol is more than that of water. Give reason.

Watch Video Solution

15. Why vegetables are cooked with difficulty at a hill station?

Watch Video Solution

2 Mark Questions

1. Name the intermolecular forces present in :

H_2O

Watch Video Solution

2. Name the intermolecular forces present in :

HCl

Watch Video Solution

3. The critical temperatures of carbon dioxide and methane are $31.1^{\circ}C$ and $-81.9^{\circ}C$, respectively. Which of them has stronger intermolecular forces and why?

Watch Video Solution

4. Explain the physical significance of vanderWaals parameters.

Watch Video Solution

5. A gas occupies 300 ml at $27^{\circ}C$ and 730 mm pressure what would be its volume at STP.

Watch Video Solution

6. The Temperature at which 28 g of N_2 will occupy a volume of 10.0 L at 2.46 atm is

Watch Video Solution

7. Compressibility factor, Z of a gas is given as

$$Z = \frac{pV}{nRT}$$

(i) What is the value of Z for an ideal gas ?

(ii) For real gas what will be the effect on value of Z above boyle's temperature ?

Watch Video Solution

8. Compressibility factor, Z of a gas is given as

$$Z = \frac{pV}{nRT}$$

(i) What is the value of Z for an ideal gas ?

(ii) For real gas what will be the effect on value of Z above boyle's temperature ?

Watch Video Solution

9. What will be the minimum pressure required to compress 500 dm^3 of air at 1 bar to 200 dm^3 at $30^\circ C$?

Watch Video Solution

10. Calculate the volume occupied by 8.8 g of CO_2 at $31.1^\circ C$ and 1 bar pressure. R= 0.083 bar L $K^{-1}mol^{-1}$.

Watch Video Solution

11. Calculate the temperature of 4.0 mol of a gas occupying d dm^3 at 3.32 bar. (R=0.083 bar $dm^3K^{-1}mol^{-1}$).

Watch Video Solution

12. The pressure of the atmosphere is 2×10^{-6} mm at about 100 mile from the earth and temperature is $-180^{\circ} C$. How many moles are three in 1 mL gas at this attitude?

Watch Video Solution

13. Calculate average kinetic energy of CO_2 molecules at $27^{\circ} C$.

Watch Video Solution

14. Calculate the root mean square speed of methane molecules at $27^{\circ} C$.

Watch Video Solution

15. Name two phenomena that can be explained on the basis of surface tension.

Watch Video Solution

16. The van der Waal constants of two gases are as follows :

Gas	*a (atm L mol^{-1})*	*b (L mol^{-1})*
A	1.39	0.0391
B	3.59	0.0427

Which of them is more easily liquefiable and which has greater molecular size?

Watch Video Solution

17. Critical temperatures of NH_3 and SO_2 are 405.0 and 430.3 K respectively :

Which one is easily liquefiable?

Watch Video Solution

18. Critical temperatures of NH_3 and SO_2 are 405.0 and 430.3 K respectively :

Which has higher value of van der Waal constant 'a'?

Watch Video Solution

19. Arrange the following in the order of property indicated for each set :

H_2O, NH_3, HCl, H_2 (increasing magnitude of intermolecular forces).

Watch Video Solution

20. Arrange the following in the order of property indicated for each set :

O_2, H_2, CO_2, SO_2 (ease of liquefaction).

Watch Video Solution

21. Arrange the following in the order of property indicated for each set :

O_2, He, CO_2, NH_3 (decreasing critical temperature).

Watch Video Solution

3 Mark Questions

1. Explain viscosity of a liquid. Discuss its cause.

Watch Video Solution

2. VAPOUR PRESSURE

Watch Video Solution

3. Explain the terms :

Boiling point temperature.

Watch Video Solution

4. Calculate the total pressure in a mixture og $8g$ of oxygen and $4g$ hydrogen confined in a vessel of $1dm^3$ at $27^\circ C$. $\left(R = 0.083 \text{bar} dm^3 K^{-1} mol^{-1}\right)$

Watch Video Solution

5. What will be the pressure exerted by a mixture of $3.2g$ of methane and $4.4g$ of carbon dixide contained in a $9dm^3$ flask at $27^\circ C$? .

Watch Video Solution

6. Pressure of $1g$ of an ideal gas A at $27^{\circ}C$ is found to be 2 bar when $2g$ of another ideal gas B is introduced in the same flask at same temperature the pressure becomes 3 bar. Find a relationship thieir molecular masses .

Watch Video Solution

7. A 20g chunk of dry ice is placed in an empty 0.75 litre wire bottle tightly closed what would be the final pressure in the bottle after all

CO_2 has been evaporated and temperature reaches to $25^\circ C$?

Watch Video Solution

8. A gas at a pressure of 5.0 atm is heated from 0° to$546^\circ C$ and is simultaneously compressed to one-third of its original volume. Hence final pressure is :

Watch Video Solution

9. Calculate the compressibility factor for CO_2 if one mole of it occupies 0.4 litre at $300K$ and $40atm$. Comment on the result:

Watch Video Solution

10. Pressure of a mixture of 4 g of O_2 and $2gH_2$ confined in a bulb of 1 litre at $0^\circ C$ is

Watch Video Solution

5 Mark Questions

1. Mention the intermolecular forces present between :

H_2O and C_2H_5OH

Watch Video Solution

2. Mention the intermolecular forces present between :

Cl_2 and CCL_4

Watch Video Solution

3. Mention the intermolecular forces present between :

He and He atoms

Watch Video Solution

4. Mention the intermolecular forces present between :

Na^+ ion and H_2O

Watch Video Solution

5. Mention the intermolecular forces present between :

HBr and HBr

Watch Video Solution

6. For Dalton's law of partial pressure derive the expression

$P_{\text{gas}} = X_{\text{gas}} \cdot P_{\text{total}}$.

Watch Video Solution

7. A $2L$ flask contains $1.6g$ of methane and $0.5g$ of hydrogen at $27^{\circ}C$. Calculate the partial pressure of each gas in the mixture and hence calculate the total pressure.

Watch Video Solution

8. Using van der Waals equation, calculate the constant a when $2mol$ of a gas confined in a $4L$ flasks exerts a pressure of $11.0atm$ at a temperature of $300K$. The value of b is $0.05Lmol^{-1}$.

Watch Video Solution

Hots Questions

1. A mixture of CO and CO_2 is found to have a density of $1.50 \ \text{g} \ L^{-1}$ at $20^\circ C$ and 740 mm pressure. Calculate the composition of the mixture.

Watch Video Solution

2. A spherical ballon of $21cm$ diameter is to be filled with hydrogen at STP from a cylinder containing the gas at $20atm$ and $27^{\circ}C$. If the cylinder can hold $2.82L$ of water, calculate the number of balloons that can be filled up .

Watch Video Solution

3. The temperature at which CO_2 has the same $R.M.S.$ Speed to that of O_2 at STP is/are:

Watch Video Solution

4. 50 litre of dry N_2 is passed through 36g of H_2O at $27^\circ C$. After passage of gas, there is a loss of 1.20g in water. Calculate vapour pressure of water.

Watch Video Solution