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Smart Plus Mavoor

SSLC CHEMISTRY

CHAPTER 2

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SSLC CHEMISTRY

CHAPTER WISE QUESTIONS.

GAS LAWS AND MOLE CONCEPT

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UNIT 2
GAS LAWS AND MOLE CONCEPT

1) Which of the following statement incorrect about the properties of gases.
   - Gas molecules can move in all direction
   - The attractive force between gas molecules are very high
   - The collision between gas molecules are perfectly elastic.
2) The properties related to gases are listed in the table, complete it.

Energy of gas molecules	
Freedom of movement of molecules	
Attractive force between gas molecules	
Distance between gas molecules	

3) Select from the box, the correct gas law related to the given situation.

Boyel's law, Charel's law, Avagadro:s law

   a) An inflated balloon is kept in sunlight it will burst after some time.
   b) The size of air bubble rising from the bottom of an aquarium increases.
   c) A balloon is being inflated.
4) Examine the data given in the table (temperature and number of gas molecules of the gas are kept in constant)

Pressure(P)	Volume(V)
1 atm	8 L
2 atm	4 L
4 atm	2 L

   a) Calculate PxV
   b) Which is the gas law related to this?
5) The volume of the gas at constant pressure is 360ml at 27^{o}C
   a) Calculate the temperature at which the volume of gas is reduced to 150ml at the same pressure?
   b) State the gas law associated to this law?
6) A gas is kept in a container have volume 5L at 1 atm pressure and 273K
   a) What is the volume of the gas?
   b) Suggest any method to increase its pressure?
   c) When the volume of the gas is changed to 20L,without change the temperature, find its new pressure?
7) Write reason
   a) In summer season the vehicle tyre mot fill completely.
   b) The size of the balloon increases with increasing its height from the sea level.
8) The relationship between volume and number of molecule of a gas at constant temperature and pressure is known as ……?

9) Mathematical expression for some gases are given below.

A) $V \alpha 1/P$

B) $V \alpha T$

C) $V \alpha n$

a) Which expression related to Charel's law?

b) The volume of definite mass of a gas at constant pressure is 400ml at 300k. find the volume of the gas at which the temperature of the gas is increased to 5ooK at the same pressure?

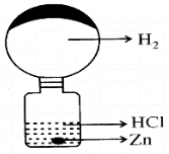
10) What are the following changes observe when rising of the temperature of the gas.

a) Movement of gas molecules.

b) Attractive force between gas molecules

c) Energy

11) A group of students prepared hydrogen balloon in the laboratory as shown in the picture below.



a) What will be the observation if this setup is taken from laboratory and placed at the sunlight for one hour?

b) Name the gas law is associated to above observation?

c) The volume of hydrogen gas at constant pressure is 500ml at 300K.calculate the temperature at which the volume is reduced to 400ml at the same temperature?

12) Certain data regarding various gases at 273K and 1 atm are given below.

Gases	Volume(L)	Number of molecules
H_2	224	10
He	112	5
O_2	224	10
NH_3	56	2.5

a) Which gas law is associated above data?

b) Write the mathematical expression of this law?

c) find the volume of h_2 gas, when its pressure changes to 2 atm from 1 atm?

13) the volume and temperature of H_2 gas at 2 atm pressure is 400ml and 25^oC respectively

a) how we can increase the volume of the gas without change its pressure?

b) Find the pressure of the gas, we its volume is changes to 200 ml(hint: temperature is constant)

c) Which gas law is related to question b.?

14) Certain data regarding various gases kept under the same condition of temperature and pressure are given below.

Gases	Volume(L)	Number of molecules
Nitrogen	10L	X
Oxygen	5L	A
Ammonia	10L	B
CO_2	C	2X

a) Complete the table?
b) Which gas law is applicable here?
c) State the law?

15) The volume of one mole of any gas at STP…….?

16) Atomic mass of nitrogen is 14. Which of the following samples contain 6.022×10^{23} nitrogen atoms?
(7g nitrogen,14g nitrogen, 28g nitrogen, 1g nitrogen)

17) The number of moles in 400g $CaCO_3$ is……?
(Hint: gram atomic masses: Ca=40 C=12 0=16)

18) The molecular mass of methane CH_4 is 16.
a) What is the mass of 1 GMM of CH_4?
b) Calculate the number of mole molecules in 160g CH_4?
c) What is the mass of $5 \times 6.022 \times 10^{23}$ CH_4 molecules?

19) The balanced chemical equation for the formation of ammonia gas by the reaction between nitrogen gas and hydrogen gas is given

$$N_2 + 3H_2 \longrightarrow 2NH_3$$

a) Write the ratio between the number of moles of reactant and product in the correct order?
b) How many moles of ammonia are formed when 6 moles of N_2 react with 6 moles of H_2?

20)
a) What is gram atomic mass?
b) Calculate the following
A) How many gram atoms of sodium is present in 115g sodium?
B) Mass of 5g atoms of calcium (hint: gram atomic masses Na:23g Ca:40g)

21) The chemical equation for the manufacturing of ammonia is

$$N_{2(g)} + 3H_{2(g)} \longrightarrow 2NH_{3(g)}$$

a) Complete the following

1 mol N_2 + ……. H_2 ⟶ ..... NH_3

b) Calculate the amount of H_2 required to react with 28g N_2 completely?
(molecular masses N_2 =28 H_2 =2)
c) What will be the volume of NH_3 formed at STP, if 22.4L of N_2 is completely reacted?

22) Atomic mass of H=1 & O=16
a) i) what will be the molecular mass of O_2?
ii) calculate the number of molecules present in 16g of O_2?
b) The chemical reaction of formation of water is given

$$2H_2 + O_2 \longrightarrow 2H_2O$$

How many moles of O_2 required for the formation of 10 mole H_2O?

23) Find out the number of molecules present in the sample given below.
a) 22.4L CO_2 gas at STP.
b) 4g of H_2 (atomic masses H=1 C=12 O=16)

24)
   a) Calculate the mass of 112L CO_2 gas kept at STP?
   b) how many molecules of O_2 are present in it?

25) How many number of molecules present in 1 GMM water?
26) What is relative atomic mass?
27) The molecular mass of oxygen is 32.
   a) What is the GMM of O_2?
   b) How many moles of molecules are there in 64g of oxygen? How many molecules are there in it?
   c) Calculate the number of oxygen atoms present in 64g of oxygen?
28) The atomic masses of some elements are given below
   (Na=23 C=12 O=16 N=14 H=1)
   a) Number of molecules present in 318g of Na_2CO_3?
   b) number of moles present in 85g NH_3?
29) A gas cylinder contain 88g of CO_2 at STP. Calculate how many number of moles of CO_2 present in it? (C=12 O=16)
30) $6.022x10^{23}$ carbon atoms are present in 12g of C-12
   a) $6.022x10^{23}$ is known as……?
   b) Calculate the number of atoms present in 48g of C-12?
   c) Which one has highest mass.
   $6.022x10^{23}$ CO_2 molecules or $6.022x10^{23}$ H_2O molecules.
31) Calculate the volume of 32g of oxygen molecules at STP? (atomic mass of O=16)
32) Some samples are given below

8g H_2	64g O_2	28N_2	10g H_2

a) Which sample contain higher number of molecules?
b) Which sample having 22.4L volume at STP?
33) The volume of methane (CH_4) gas at STP is 224L
   a) Calculate the number of molecules present in it?
   b) Calculate the mass of NO_2 (nitrogen dioxide) gas of 224L
34) The molecular mass of ammonia is 17.
   a) How much is the GMM of ammonia?
   b) Find out the number of moles of molecules present in the above sample of NH_3?
   c) Calculate the number of ammonia molecule present in the above sample of NH_3?
35) Calculate the number of molecules present in following samples?
   (GMM N_2=28g H_2O =18g)
   a) 56g N_2 b) 90g H_2O
36) Complete the flow chart