# CHEMISTRY

# BOOKS - BODY BOOKS PUBLICATION

# GAS LAWS AND MOLE CONCEPT

## Example

**1.** If a gas which is kept in a cylinder having a volume of 1 litre, is completely transferred to

another 5 litre cylinder then what will be the volumeof thegas?

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**2.** Press the piston after closing the nozzle of thesyringe.What will happen to the volume of air inside'the syringe ?

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**3.** Press the piston after closing the nozzle of thesyringe.What will happen to the volume of air inside'the syringe Explain it on the basis of the distance be-tween the molecules of gas and their freedom of movement inside the syringe?

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**4.** Which energy gained due to the movement of molecules ? Potential energy/Kinetic energy.

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**5.** When a gas is heated, temperature is increased.What happensto the movement of molecules if the temperature of the gas is increased?

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**6.** When a gas is heated, as a result, what happens to the energy of the molecules ?

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**7.** Define Volume

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**8.** Define Pressure

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**9.** What happens to the pressure when the volume is decreased ?

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**10.** What changes can you observe in the volume of the gas inside the syringe?

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**11.** What relation do you arrive at between pressure and volume of the gas?

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**12.** The size of the air bubbles rising from the bottom of an aquarium increases.Can you explain the reason ?

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**13.** The size of air bubbles rising from the bottom of an aquarium increases. Can you explain the reason?

What do you observe?

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**14.** What is the reason for the rising of the ink upwards?

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**15.** What did you observe on cooling the bottle after taking it out ? Why?

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**16.** What can you infer about the relation between the volume and temperature of a gas?

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**17.** In which unit is the temperature stated?

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**18.** What happens to the volume when the temperature is increased?

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**19.** If a inflated ballon is kept in sunlight, it will burst. What may be the reason for this?

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**20.** What happens to the volume of the gas when its pressure is decreased or temperature is increased. Volume increased/ decreased ?

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**21.** If the temperature and pressure are kept constant how can we in crease the volume?

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**22.** Fill the cylinder with a little more gas. Does the number of molecules increase or decrease now ?

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**23.** What is the relation between the volume and number of molecules?

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**24.** According to Avagadro's law when the temperature and pressure remain constant on which factor does the volume of gas depend?

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**25.** If the mass of a coin 5g, then what will be the mass of thousand coins?

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**26.** The mass of one coin is 5g. If the mass of coins in a bag is 50,000g, then how many coins will be there?

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**27.** (i) If the mass of a coin 5g, then what will be the mass of thousand coins.

(ii) if the mass of coin in the bag is 50,000g, then how many coins will be there?

(iii)Like this we can calculate the number of coins on the basis of mass. Can't we?

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**28.** Is their any relation between the mass and the number, if the particles are the same mass.

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**29.** What may be method of stating the mass of atoms?

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**30.** What do you understand from the statement that the atomic mass of Helium is 4?

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**31.** How many oxygen atoms combine with one carbon atom?

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**32.** How many oxygen atom combine with 1000 carbon atoms?

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**33.** How many atoms are present in 12g carbon?

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**34.** A carbon atom combines with two oxygen atoms. If so, how many oxygen atoms are needed for combining with $6.022 \times 10^{23}$ carbonatoms?

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**35.**

**A carbon atom combines with two oxygen atoms. If so, how many oxygen atoms are needed for combining with $6.022 \times 10^{23}$ carbon atoms ?**

What will be the mass of these atoms?

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**36.** 1GAM sodium means 23g sodium.This contains $6.022 \times 10^{23}$ atoms. If so, howmany GAM is present in 69g sodium? How many atoms are present in it?

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**37.** How many GAMs are present in each the samples given below? Calculate the number of

atoms present in each of the sample ? (Atomic mass N= 14,0=16). 42g Nitrogen.

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**38.** How many GAMs are present in each the samples given below? Calculate thenum-berof atomspresentin eachof thesample ? (Atomic mass N= 14,0=16). 42g Nitrogen. 80g Oxygen,

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**39.** Calculate the molecular mass of glucose $(C_6H_{12}O_6$ and sulphuric acid $(H_2SO_4)$

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**40.** What is the molecular mass of oxygen?

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**41.** How many GMM is present in 32g oxygen?

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**42.** In 90 gram of water, How many molecules are present in it?

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**43.** How many GMM is present in 28 gm nitrogen?

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**44.** How many molecules are present in $1gN_2$?

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**45.** How many GMM is present in 18 gm water?

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**46.** How many $H_2O$ molecules are present in 90g of water

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**47.** Calculate the number of GMM present in 96g oxygen?

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**48.** How many GMM are present in eac o fth egiven samples? Calculate the number of molecules present in each sample? 360 g glucos (molecular mass=180)

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**49.** Find the number of moles in 90 g of water (Molecular mass=18). ?

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**50.** How many molecules of water are present in one mole of water?

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**51.** What is the mass?

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**52.** How many GMM is present in one mole of water?

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**53.** Examine the date given in the table (Temperature and number of molecules of the

gas are kept constant).

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

:

Calculate $P \times V$

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**54.** Examine the date given in the table (Temperature and number of molecules of the gas are kept constant).

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

:

Calculate Which is the gas law realted to this?

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**55.** Analyse the situations given belwo and explain the gas law associated with it: When an inflated baloon is immersed in water, its size decreases.

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**56.** Analyse the situations given below and explain the gas law associated with it: A balloon is being inflated.

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**57.** Certain data regardin bvarious gasses kept under the same conditions of temperature and pressure are given below.

| Gas | Volume (L) | No. of molecules |
|---|---|---|
| Nitrogen | 10 L | $x$ |
| Oxygen | 5 L | ..... |
| Ammonia | 10 L | ..... |
| Carbon di oxide | ..... | $2x$ |

Complete the table?

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**58.** Certain data regardin bvarious gasses kept under the same conditions of temperature and pressure are given below.

| Gas | Volume (L) | No. of molecules |
|---|---|---|
| Nitrogen | 10 L | $x$ |
| Oxygen | 5 L | ..... |
| Ammonia | 10 L | ..... |
| Carbon di oxide | ..... | $2x$ |

Which gas law is applicable here?

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**59.** Calculate the mass of 112 L $CO_2$ gas kept at STP (molecular mass=44).

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**60.** a) Calculate the mass of 112 L $CO_2$ gas kept at STP (molecular mass = 44).

b) How many molecules of $CO_2$ are present in it?

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**61.** Calculate the volume of 170g of ammonia at STP? (Molecular mass 17).

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**62.** Find out the number of moles of molecules present in the samples given below $(GMM - N_2 = 28g, H_2O = 18g)$: $56gN_2$

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**63.** Find out the number of moles of molecules present in the samples given below $(GMM - N_2 = 28g, H_2O = 18g)$: $90gH_2O$

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**64.** The molecular mass of ammonia is 17: How much is the GMM of ammonia?


**65.** The molecular mass of ammonia is 17: Find out the number of moles of molecules present in 170g of ammonia.

**66.** The molecular mass of oxygen is 32: What is the GMM of $O_2$

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**67.** The molecules mass of oxygen is 32: How many moles of molecules are there in 64g of oxygen? How many molecules are there in it?

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**68.** How many grams of carbon and oxygen are required to get the same number of atoms as in one gram of Helium?

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**69.** Examine the samples given: 20 g of $He$, 44.8 L of $NH_3$ at STP, 67.2 L of $N_2$ at STP, 1 mol of $H_2SO_4$ and 180 g of $H_2O$: Arrange the samples in the increasing order of the number of molecules in each.

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**70.** Caluclate the number of moles of O2 present in 64g of oxygen molecule?

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**71.**

**Examine the samples given:**

**a. 20 g of He** **b. 44.8 L of $NH_3$ at STP**

**c. 67.2 L of $N_2$ at STP**

**d. 1 mol of $H_2SO_4$** **e. 180 g of water.**

What will be the ascending order of the total number of atoms.

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72.

Examine the samples given:

a. 20 g of He b. 44.8 L of $NH_3$ at STP

c. 67.2 L of $N_2$ at STP

d. 1 mol of $H_2SO_4$ e. 180 g of water.

What will be masses of samples b, c, and d?

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**73.** In 90 gram fo water: How many molecules are present?

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**74.** In 90 gram of water: What will be the total number of atoms?

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**75.** In 90 gram of water: What will be the total number of electrons in this sample?

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**76.** Complete the table based on the data given in the box.

| $Br, N_2, N, Cl, Cl_2, Br_2, P, H, O_2, H_2, P_4, C, Na$ |
|---|

| Atom | Atomic weight | Molecule | Molecular Weight |
|---|---|---|---|
| | | | |

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**77.** What are atomic weight and molecular weight in grams

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**78.** 10 Mole of water=.....g..... Molecules

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**79.** 5 mole of CaO=.....g..... Molecules

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**80.** 2 mole of $H_2SO_4$=.....g..... Molecules

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**81.** $\frac{1}{2}$ mole of $AI_2O_4$=.....g..... Molecules

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**82.** Complete the table

| Molecule/ atom | Atomic weight/ Molecular weight | Given weight | Mole | $N_A$ |
|---|---|---|---|---|
| H | | | 20 | |
| $H_2O$ | | 360g | | |
| Cl | 35.5 | | 5 | |
| Ca | 40 | | | $2.5 \times 6.022 \times 10^{23}$ |
| HCl | 36.5 | | 2 | |
| $CO_2$ | | | 20 | |

**Ans.**

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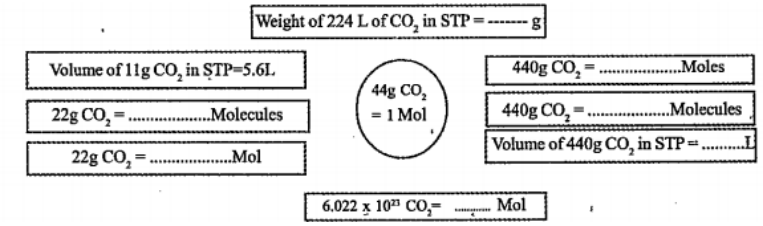
**83.** Complete the table

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**84.** Based on the reaction given below, write the answer for the questions. $N_2 + 3H_2 \rightarrow 2NH_3$. Write the ratio of the reactant molecules and product molecules.

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**85.** Based on the reaction given belwo, write the answer for the questions. $N_2 + 3H_2 \rightarrow 2NH_3$: Howmany moles of Ammonia forms when we take 2 moles of Nitrogen and six moles of Hydrogen?

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**86.** Based on the reaction given below, write the answer for the questions. $N_2 + 3H_2 \rightarrow 2NH_3$: Two moles of Nitrogen

and three moles for hydrogen are taken in jar?

Will they they react together?

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**87.** Based on the reaction given below, write the answer for the questions. $N_2 + 3H_2 \rightarrow 2NH_3$: How many moles Nitrogen and Hydrgen is needed for getting 20 moles of Ammonia?

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**88.** Balance the given equation and then write down the answers for the question given below. $CH_4 + O_2 \rightarrow CO_2 + H_2O$: How many moles of $CO_2$ formed when 20 moles of Methane burn in air?

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**89.** Balance the given equation and then write down the answers for the question given below. $2C_2H_6 + 7O_2 \rightarrow 4CO_2 + 6H_2O$ : Based on the equation above, How many

moles of $CO_2$ is formed when 10 moles of Ethane is burned in air?

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**90.** Based on the given equation write down the answers. $2H_2 + O_2 \rightarrow H_2O$: How much Oxygen and Hydrogen is needed for making 1800g of water va-pour?

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**91.** Based on the given equation write down the answers. $2H_2 + O_2 \rightarrow H_2O$: How many moles of Oxygen is needed for the reaction with one mole of Hydrogen?

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**92.** Find out the number of moles of hydrogen and chlorine atoms present in 10 moles of $HCl$.

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**93.** Find out the mass of Hydrogen atom and chlo-rine atom in 10 moles of HCI.

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**94.** Find out the mass of one mole of $CaCO_3$. How many moles of calcium present in 1000g $CaCO_3$?

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**95.** How many moles of oxygen present in 1000gms of $CaCO_3$?

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**96.** Find out the number of moles of water formed when 4 gms of Hydrogen and 32 gms of Oxy-gen combined together. What is the result when 5 gms of Hydrogen and 32gms of Oxygen combined together?

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**97.** How much grams fo NaCI is needed for making 2 molar solution (NaCI-58.5). W h-at is the amount of water needed for this?

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**98.** How will you change a two molar solution of Sodium chloride into 5 molar?

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**99.** How many moles of $CI_2$ present in 11.2L of same in STP? Find out the mass of this?

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**100.** Find out the mass of oxygen atom in 44.8L of $CO_2$ in STP.

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**101.** Find out the amount of $CO_2$ formed when the burning of one mole of Ethane.

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**102.** Why are atomic mass of some elements are in fractions?

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**103.** One GAM substance contains Avogadro number of particles in it: How many particles are there in Avogadro number.

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**104.** One GAM substance contains Avogadro number of particles in it: Write the number of atoms present in each of the following: 32g Sulphur, 32g Oxygen, 32g Carbon

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**105.** Group the following into pairs having same number of atoms: 2g Hydrogen, 16g Oxygen, 14g Nitrogen, 8g Helium (Atomic mass H=1, 0=16, N=14,He=4)

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**106.** $2H_2 + O_2 \rightarrow 2H_2O$: What is the ratio between the reactant molecules in the above reaction?

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**107.** $N_2 + 3H_2 \rightarrow 2NH_3$ Complete the followign table

| Nitrogen molecules. | Hydrogen molecules | Molecules formed | Remaining after the reaction |
|---|---|---|---|
| $1N_2$ | $3H_2$ | (a) | Remains nothing |
| $2N_2$ | $7H_2$ | $2NH_3$ | (b) |
| $4N_2$ | (c) | (d) | Remains nothing |

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**108.** $2H_2 + O_2 \rightarrow 2H_2O$: What is the ratio between the reactant molecules in the above reaction?

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**109.** $2H_2 + O_2 \rightarrow 2H_2O$: How many water molecules are formed when 1000 $H_2$ molecules are reacted co-mpletely?

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**110.** $2H_2 + O_2 \rightarrow 2H_2O$: How many water molecules are formed when 1000 $H_2$ molecules are reacted co-mpletely?

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**111.** Complete the following table. (All the elements given are diatomic. Atomic mass O=16, N=14, CI=35.5)

| GAM | No. of atoms | GMM | No.of Molecules |
|---|---|---|---|
| 16g Oxygen | $6.022 \times 10^{23}$ atoms | 32g Oxygen | .....a.....molecules |
| 35.5g Chlorine | .....b.....atoms | .....c.....g Chlorine | $6.022 \times 10^{23}$molecules |
| .....d.....g Nitrogen | $6.022 \times 10^{23}$atoms | 28g Nitrogen | $6.022 \times 10^{23}$ molecules |

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**112.** 4 Sample of substances are given Which of these samples have same number of molecules?68g $NH_3$, 28g $N_2$ , 49g $H_2SO_4$ , 128g $O_2$

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**113.** 4 Sample of substances are given, Which of these sample has least number of

molecules? 52g $N_2O_5$ , 36g $H_2O$ , 28g CO , 51 g $NH_3$

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**114.** Pick out the correct statements from the following. Also correct the incorrect statements: The number of molecules present in 1 mol hydrogen and 1 mol oxygen are same.

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**115.** Pick out the correct statements from the following. Also correct the incorrect statements: 2 mol chlorine contain $4 \times 6.022 \times 10^{23}$ chlorine molcules.

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**116.** Pick out the correct statements from the following. Also correct the incorrect statements: The mass of $\frac{1}{2}$ mol nitrogen gas is 14 g.

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**117.** Pick out the correct statements from the following. Also correct the incorrect statements: 0.5 mol water has the mass 9g. There are $6.022 \times 10^{23} H_2O$ molecules in it. (Atomic mass H=1,O=16,CI=35.5, N=14)

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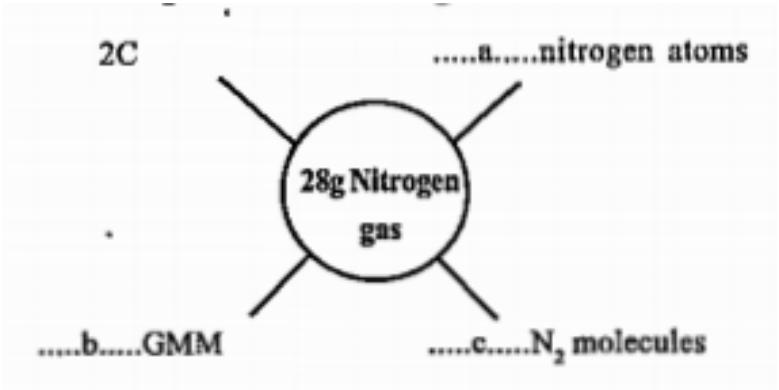
**118.** Complete the following.

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**119.** 67.2L of Carbon dioxide gas is filled in a cylinder at STP: Calculate the mass of $CO_2$ present in it. (Atomic mass-C=12,O=16)

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**120.** 67.2L of Carbon dioxide gas is filled in a cylinder at STP: Calculat the numbe rof molecules pres-ent in the cylinder.

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**121.** Complete the table:

| Substance | GMM | Given mass | No. of moles | No. of. molecules | Volume of STP |
|---|---|---|---|---|---|
| $O_2$ (MM=32) | 32g | 64g | (a) | (b) | 2x22.4L |
| $NH_3$ (MM=17) | (c) | (d) | (e) | $3 \times 6.022 \times 10^{23}$ | (f) |

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**122.** $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ the equation describe the combution of me-thane in air: How many moles of oxygen is required for the complete combustion of 16g $CH_4$?

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**123.** $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$ the equation describe the combution of me-thane

in air: Caclulate the amount of $CO_2$ formed when 100g of $CH_4$ is completely burnt?

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**124.** 45 g glucose is taken ina beaker and made into 1L (MM=180): Calculate the molarity of the solution.

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**125.** 45 g of glucose is taken in a beaker and made into 1L (MM=180): Above solution is made up to 2L by adding more water. What will be the molarity of the resultant solution?

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**126.** 45 g of glucose is taken in a beaker and made into 1L (MM=180): How will you prepare IM solution of glucose with the same quantity (45g) of glucose?

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**127.** Two gases occupy equal volume at STP are shown below.A -320 g$SO_2$ B-.....g $NO_2$ Find the mass of the gas in B.

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**128.** Two gases occupy equal volume at STP are shown below. A -320 g$SO_2$ B-.....g $NO_2$ Calculate the number of molecules present in B.

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**129.** The balanced chemical equation of a reaction (at STP) is given below. $2H_{2((g))} + O_{2(g)} \rightarrow 2H_2O_{(g)}$: Calculation the volume of oxygen required to combine completely with 224L of the hydrogen at STP.

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**130.** The balanced chemical equation of a reaction (at STP) is given below. $2H_{2((g))} + O_{2(g)} \rightarrow 2H_2O_{(g)}$: Calculate the mass of water formed as a result of the reaction (a).

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**131.** Complete the table

| Gas | Volume at STP | Mole | Mass |
|---|---|---|---|
| $CO_2$ | (a) | 3 | (b) |
| $CH_4$ | 5.6L | (c) | (d) |
| $SO_2$ | (e) | (f) | 32g |

Hint:

(MM-CO_2=44,CH_4=16,SO_2=64)

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**132.** Analyse the following equation $2NO_{(g)} + O_{2(g)} \rightarrow 2NO_{2(g)}$: Calculate the number of the moles of NO required to combine completely with 112L of Oxygen at STP.

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**133.** Analyse the following equation $2NO_{(g)} + O_{2(g)} \rightarrow 2NO_{2(g)}$: Calculate the mass of $NO_2$ formed when 112L of oxygen react completely?

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**134.** The chemical equation of the decomposition of calcium carbonate is given below $CaCO_3 \rightarrow CaO + CO_2$ (HintMM:

CaCO_3-100,CaO-56, CO_2-44): Calculate the mass of $CaCO_3$ required to get 224 g of CaO?

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**135.** The chemical equation of the decomposition of calcium carbonate is given below $CaCO_3 \rightarrow CaO + CO_2$ (HintMM: CaCO_3-100,CaO-56, CO_2-44): Calculate the number of $CO_2$ molecules fromed when 224g of CaO is obtained?

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**136.** You are requested to make20 moles of NaCl into packets of 100g each.(Hint:Molecular mass of NaCI is58.5): How many packets of NaCI can be pre-pared?

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**137.** You are requested to make20 moles of NaCl into packets of 100g each.(Hint:Molecular mass of NaCI is58.5): Is there any NaCI remaining? If so, how much?

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**138.** GAM of Hydrogen is 1g: How many number of atoms are there in 1 g of Hydrogen?

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**139.** GAM of Hydrogen is 1g: Find the mass of 1 atom of hydrogen.

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**140.** Number of molecules of substance is $3.011 \times 10^{24}$: What is the number of molecules of 1 mole of any substance?

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**141.** Number of molecules of substance is $3.011 \times 10^{24}$: Find the number of moles of $3.011 \times 10^{24}$ molecules.

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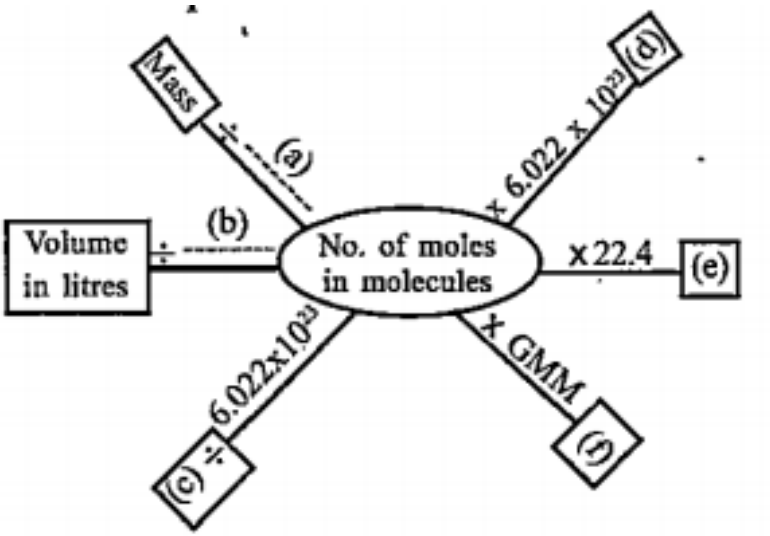
**142.** Fill the patterns:

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**143.** Identify the incorrect statements from those given with respect to the arrangements

of molecules in gases: Collision take place between the molecules.

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**144.** Identify the incorrect statements from those given with respect to the arrangements of molecules in gases: Collision take place between the molecules.

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**145.** Identify the incorrect statements from those given with respect to the arrangements of molecules in gases: Increasing the number of molecules at constant volume causes the decrease in number of collisions.

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**146.** Identify the incorrect statements from those given with respect to the arrangements of molecules in gases: Increasing the number

of molecules at constant volume causes the decrease in number of collisions.

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**147.** The pressure of 20L of a gas kept at 300 K is found to be 2 atm. If the pressure is increased to 3 atm at the same temperauture, What wil be the new volume?

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**148.** If the temperature of 5L of a gas at atmospheric pressure is changed from 200K to 50K, what will be the volume?

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**149.** What will be mass of 89.6L of ammonia `(NH_3) gas at STP?

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**150.** What is molar volume?

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**151.** What is the molar volue of a gas at STP?

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**152.** Look at the balance equation given. $2NaOH + CO_2 \rightarrow Na_2CO_3 + H_2O$: Find

out the mass of NaOH needed for 264 g $CO_2$ to react completely.

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153.

Look at the balanced equation given.

$2NaOH + CO_2 \rightarrow Na_2CO_3 + H_2O$

a. Find out the mass of NaOH needed for 264 g $CO_2$ to react completely.

b. Find out the total number of moles of water molecules when $CO_2$ reacts.

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**154.** $2C_4H_{10} + 13O_2 \rightarrow 8CO_2 + 10H_2O$ This is the equation of ignition of cooking gas butane. Calculate the volume of $CO_2$ in STP during the complete ignition of 14 kg of cooking gas.

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**155.** Write down the preparation of 100 mL NaOH solution of 0.1 M.

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**156.** The molarity fo 250 ml of $Na_2CO_3$ solution is 0.5M. Find the mass of $Na_3CO_3$.

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**157.** 63 g $HNO_3$ is in the dilute sulution of 200 mL $HNO_3$ (Nitric acid). Find the molarity.

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**158.** Some equations related to gas laws are given below: $V \alpha P$, $\frac{V}{T} =$ a constant, $V \alpha n$, PV=a constant: Which of these are correct?

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**159.** Some equations related to gas laws are given below: $V \alpha P$, $\frac{V}{T} =$ a constant, $V \alpha n$, PV=a constant: Write the gas law to which it is related for the correct equations.

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**160.** In 100 g of $CaCO_3$: Find out the number of moles of each element and atom.

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**161.** In 100 g of $CaCO_3$: Find out the total number of atoms of each element.

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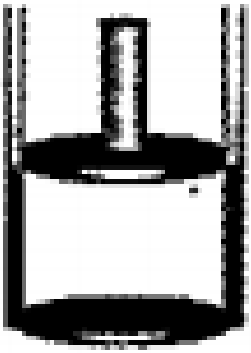
**162.** $CO_2$ gas is taken in a cylinder provided with a piston. The cylinder is dipped in hot water: What happens to the movement of $CO_2$ molecules?



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**163.** $CO_2$ gas is taken in a cylinder provided with a piston. The cylinder is dipped in hot water: What is the relation between temperature and the volume of a gas?

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**164.** $CO_2$ gas is taken in a cylinder provided with a piston. The cylinder is dipped in hot water: State this gas law.

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**165.** The molecular formula of ammonium sulphate is $(NH_4)_2SO_4$: Find the gram molecular mass (GMM) of ammonium sulphate.

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**166.** The molecular formula of ammonium sulphate is $(NH_4)_2SO_4$: Calculate the number of molecules and atoms in 1.32g of ammonium sulphate.

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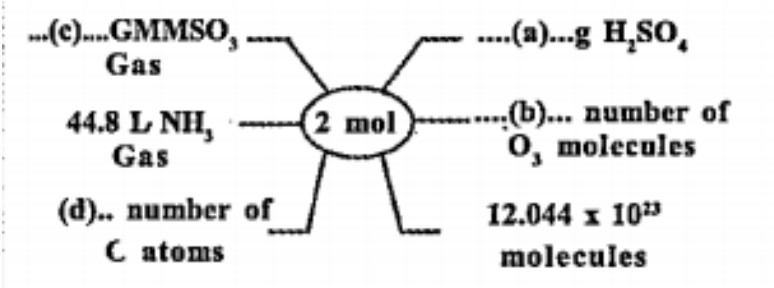
**167.** See the diagram given below and answer accordingly.

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**168.** Write in pairs, equal number of atoms from those given below:

A. A) 2g Hydrogen

B. B) 16g Oxygen

C. C) 14g Nitrogen

D. D) 8g Helium

**Answer:**

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**169.** The number of atoms present in 16 g of oxygen is:

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**170.** Write in pairs, equal number of atoms from those given below:

A. 2 g Hydrogen

B. 14 g Nitrogen

C. 8 g Helium

D. 16 g Oxygen

**Answer:**

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**171.** Calculate number of atoms in 8 g Helium

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**172.** Certain compounds and its masses are given. 68 g $NH_3$, 28 g$N_2$, $9gH_2O$,128gO_2` : Which of these compounds have equal number of molecules?

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**173.** Certain compounds and its masses are given: 68 g $NH_3$, 28 g$N_2$, $9gH_2O$,128$g$O_2` : How many molecules are there?

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**174.** Certain compounds and its masses are given: 68 g $NH_3$, 28 g$N_2$, $9gH_2O$,128$g$O_2` : How many atoms are there in 9 g of water?

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**175.** 368 $gNO_2$ gas is given. Find the answers of each one given below: GMM of $NO_2$

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**176.** 368 $gNO_2$ gas is given. Find the answers of each one given below: Number of moles of molecules of 368 g $NO_2$

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**177.** 368 $gNO_2$ gas is given. Find the answers of each one given below: Number of molecules

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**178.** 368 $gNO_2$ gas is given. Find the answers of each one given below: Volum in STP

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**179.** Find out the GMM of the following. Also find out the total number of atoms: 20 g Nitrogen $(N_2)$

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**180.** Find out the GMM of the following. Also find out the total number of atoms: 88.75 g Chlorine $(CI_2)$

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**181.** Find out the GMM of the following. Also find out the total number of atoms: 4 g Chlorine $(Cl_2)$

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**182.** Find out the GMM of the following. Also find out the total number of atoms: 7.75 g phosphorus$(P_2)$

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## Exercise

**1.** Identify the relation and complete: Atomic Mass of 1g carbon-12 g. Atomic Mass of 1g Oxygen.....

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**2.** Identify the relation and complete: $6.022 \times 10^{23}$ Hydrogen atoms (H)=1g. $6.022 \times 10^{23}$ Hydrogen molecules $(H_2)$ .....

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**3.** Find the molecular mass of the followign $H_2O, HNO_3, H_2SO_4$.

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**4.** Arrange the following samples in the increasing order of the molecules in each: 1g Hydrogen, 1 Litre hydrogen (STP), 1 mole Hydrogen gas.

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**5.** The balanced equation of the reaction when Hydrogen and chlorine combine to form hydrogen chloride is given below: $H_2 + Cl_2 \rightarrow 2HCl$ What is the number of moles of HCl obtained when 4 moles of Hydrogen and 6 moles of chlorine are combined?

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**6.** The balanced equation of the reaction when Hydrogen and chlorine to form hydro-gen chloride is given below:

$H_2 + Cl_2 \rightarrow 2HCl$

What is the number of moles of $HCl$ obtained when 4 moles of Hydrogen and 6 moles of Chlorine are combined?

Will any of the reactants remain as a result of this reaction. If any how much?

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