



# **CHEMISTRY**

# BOOKS - JEEVITH PUBLICATIONS CHEMISTRY (KANNADA ENGLISH)

# SOME BASIC CONCEPTS OF CHEMISTRY

One Mark Questions And Answers

1. Define compounds.



2. Define Atomic weight.



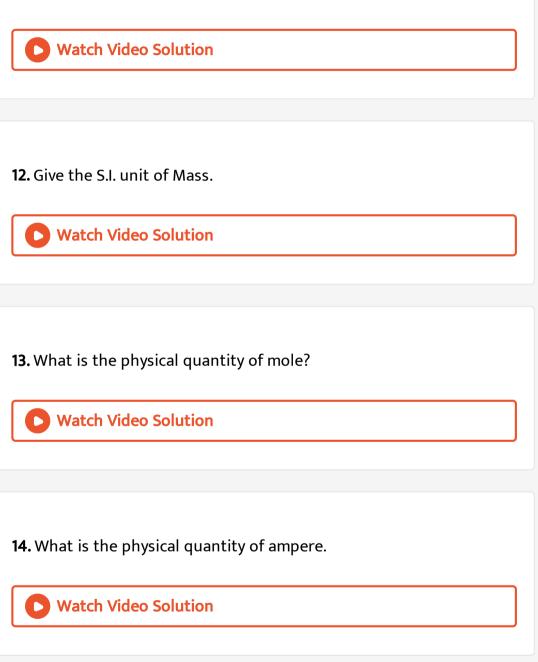
**3.** Give an example for compounds.

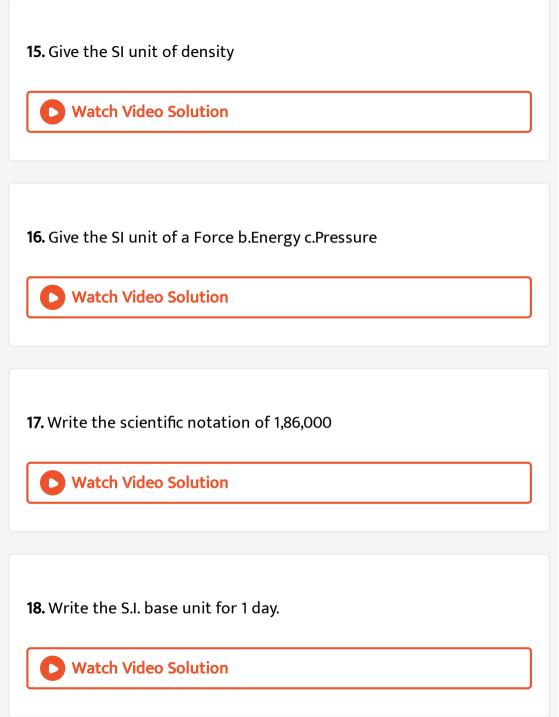
Watch Video Solution
<b>4.</b> Define mixtures.
Watch Video Solution
<b>5.</b> Give an example for mixtures.
Watch Video Solution
<b>6.</b> Define mixtures.
o. Denne mixtures.
Watch Video Solution

# 7. Define atom.

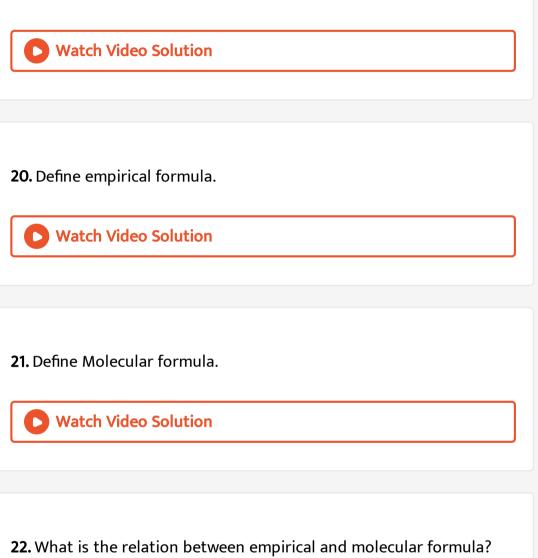
Vatch Video Solution
<b>8.</b> Define molecule.
Watch Video Solution
9. What is a unit?
Watch Video Solution
<b>10.</b> Define avogadro's law.
<b>Vatch Video Solution</b>

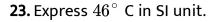
11. (	Give	the	S.I.	unit	of	Length.
-------	------	-----	------	------	----	---------





# 19. Write 93 million mile in SI unit





Watch Video Solution
24. Define law of conservation of mass.
Watch Video Solution
25. Write 50000 g in exponential form (3 significant figures).

Watch Video Solution

**26.** Write 53400 g in exponented form (significant figures).

27. What physical quantities are represented by the following units and what are their most common names? (i) kg m  $s^{-2}$ , (ii)  $kgm^2s^{-2}$ , (iii)  $dm^3$ 

Watch Video Solution

28. Who discovered law of conservation of mass.

Watch Video Solution

**29.** Classify the following substances into elements, compounds and mixtures: (i) Milk, (ii) 22-caret gold , (iii) Iodized table salt , (iv) Diamond, (v) Smoke, (vi) Steel, (vii) Brass, (viii) Dry ice (ix) Mercury, (x) Air, (xi) Aerated drinks, (xii) Glucose, (xiii) Petrol/Diesel/Kerosene oil, (xiv) Steam (xv) cloud.

30. Why is air sometimes considered as a heterogenous mixture?

31.	Who	discovered	law	of	constant	composition	а	definite
pro	portio	n.						

Watch Video Solution

Watch Video Solution

**32.** Who discovered law of constant composition a definite proportion.



33. Who proposed atomic theory of matter?

A. Dalton

B. Thomson

C. Mandleev

D. None of these

Answer: A

Watch Video Solution

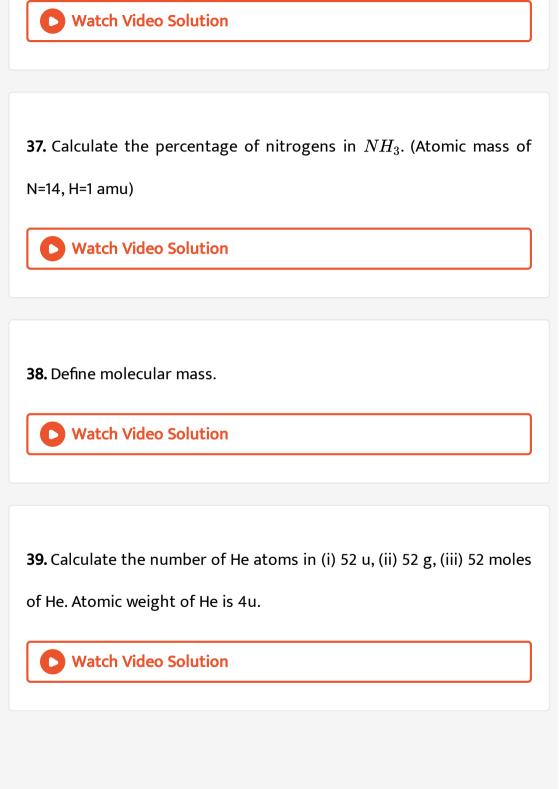
34. What is amu?

Watch Video Solution

35. Define amU (u)

Watch Video Solution

36. Define atomic mass.



**40.** How many electrons are present in 16 g of  $CH_4$  ?

Watch Video Solution
<b>41.</b> Boron occurs in nature in the form of two isotopes $B_5^{11}$ and $B_5^{10}$ in ratio of 81 % and 19% respectively. Calculate its average atomic mass.
<b>O</b> Watch Video Solution
<b>42.</b> If 2 litres of $N_2$ is mixed 2 litres of $H_2$ at a constant temperature

and pressure. What will be the volume of  $NH_3$  formed?

0
---

**43.** How many atoms are present in 4 ml of  $NH_3$  at STP?

**44.** Which of these weights most? (i) 32 g of oxygen, (ii) 2 g atom of hydrogen, (iii) 0.5 mole of Fe, (iv)  $3.01 \times 10^{23}$  atoms of carbon.

	Watch Video Solution	
--	----------------------	--

**45.** An element has a specific heat of  $0.113 cal \, / \, gC^{\,\circ}$  . Calculate atomic

weight of element.

Watch Video Solution

46. Why are the atomic masses of most of the elements fractional?



**47.** Define one mole.



**48.** Match the following prefixes with their multiples.

Prefixes	Multiples
(i) micro	10
(ii) deca	10 <sup>9</sup>
(iii) mega	10-6
(iv) giga	10-15
(v) femto	10

Watch Video Solution

**49.** Calculate the molar mass of the following: (i)  $H_2O$ , (ii)  $CO_2$ , (iii)

 $CH_4$ 

50. What is molar mass.

<b>Watch Video Solution</b>
<b>51.</b> What is the value of one mole.
<b>Vatch Video Solution</b>
<b>52.</b> What is percentage composition.
Watch Video Solution

**53.** How to calculate % mass of an element.

**54.** Define G and g. how are they telated to eachother ? Use this relation to calculate mass of earth.



55. Define limiting reagent.

A. reactant which is completely consumed during the reaction.

B. reactant which is present in limiting amount

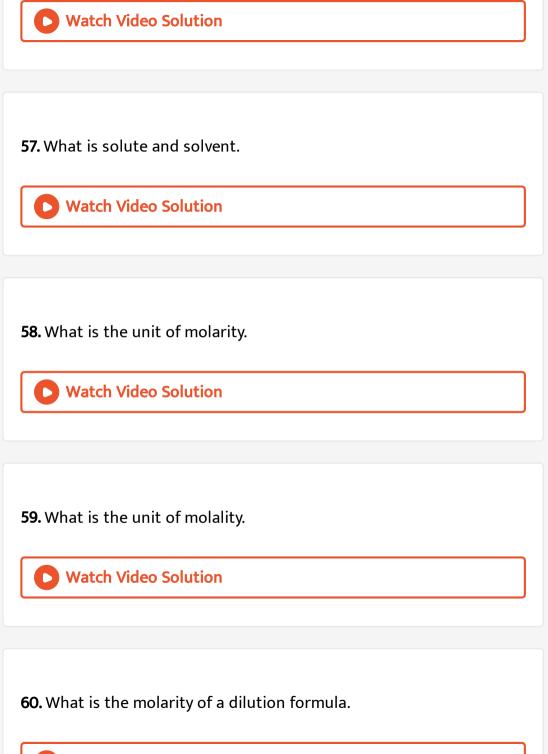
C. reactant which decides the amount of product formed

D. All of these

### Answer: D

Watch Video Solution

56. Define solution.



Two Marks Questions And Answers

1. Write any two differentiate between a compound and a mixtures.

Watch Video Solution

2. Explain homogenous mixtures? Give one example.

Watch Video Solution

3. Explain heterogenous mixtures Give one example

**Watch Video Solution** 

4. Explain the concept of element.



5. Gun powder is a mixture of sulphur, charcoal and potassium nitrate

 $(KNO_3)$ . How would you separate it into its constituent.

> Watch Video Solution

**6.** Give S.I. unit of the following physical quantity time, thermodynamic temperature, luminous intensity.

**Watch Video Solution** 

7. Write the mathematical form for mole fraction.

# 8. Define one mole.

Watch Video Solution

9. Match the following prefixes with they multiples:

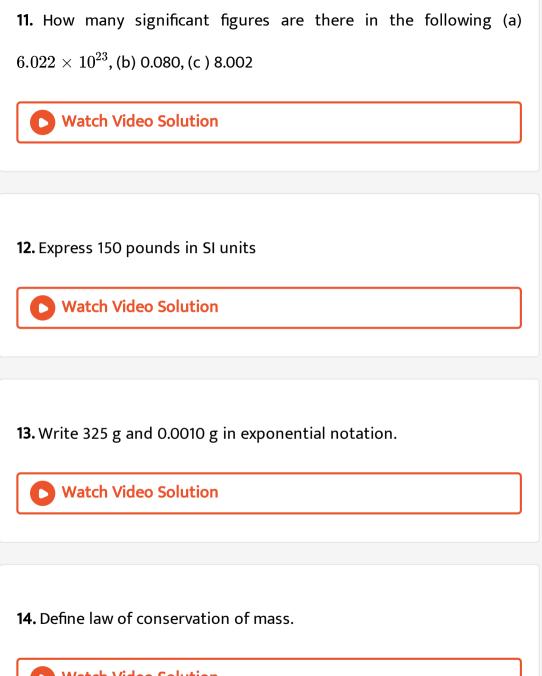
Prefixes	Multiples
Peta	10-15
Femto	10 <sup>21</sup>
Tera	10 <sup>12</sup>
Zeta	1015

Watch Video Solution

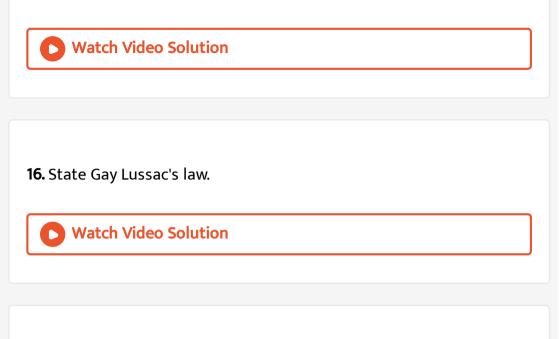
10. Calculate molarity and normality of the following solution. (a) HCl,

(b)  $H_2C_2O_4$ 





**15.** Explain law of constant composition with suitable example.



17. Compute the mass of one molecule and the molecular mass of

 $C_6H_6$  (benzene). (At mass of C=12, H=1 u).

Watch Video Solution

18. An organometallic compound on analysis was found to contain,

 $C=64.4\,\%\,, H=5.5\,\%\,$  and Fe = 29.9%. Determine its empricial

formula. (At. Mass of Fe = 56 u).

**19.** 4 g of copper chloride on analysis was founded to contain 1.890 g of copper (Cu) and 2.110 g of chlorine (Cl). What is the empirical formula of copper chloride? [At. Mass of Cu= 63.5 u, Cl = 35.5 u].

Watch Video Solution

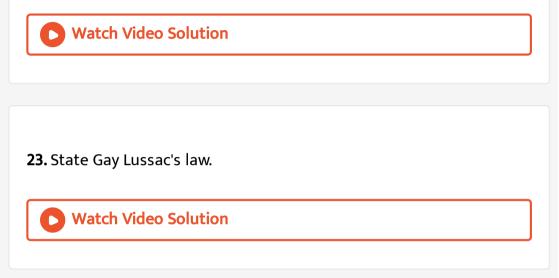
**20.** Calculate the number of grams of oxygen in 0.10 mol of  $Na_2CO_3.10H_2O$ .

Watch Video Solution

**21.** How many grams of  $Cl_2$  are required to completely react with 0.4

g of  $H_2$  to yield HCl? Also calculate the amount of HCl formed.

**22.** Conc. HCl is 38 % HCl by mass. What is the molarity of this solution is d=1.19 g  $cm^{-3}$ ? What volume of conc. HCl is required to make 1.00 L of 0.10 M HCl?



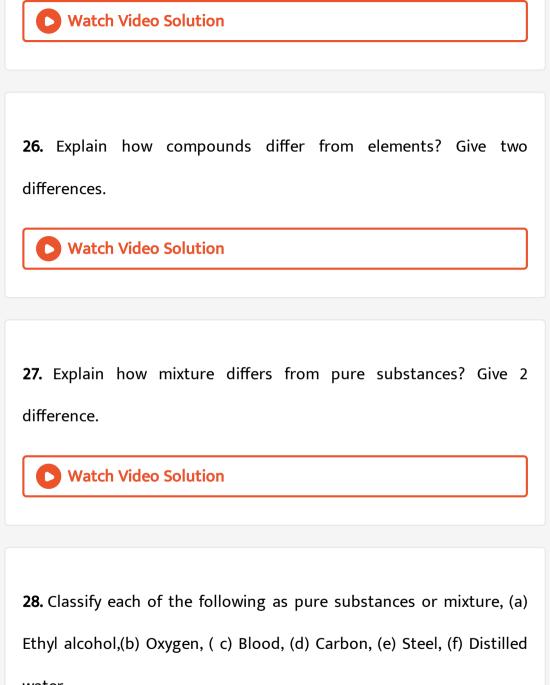
24. Calculate the volume of  $O_2$  at STP liberated by heating 12.25 g of

*KCIO*<sub>3</sub>. (At. Wt. of K=39, Cl=35.5, O=16 u)



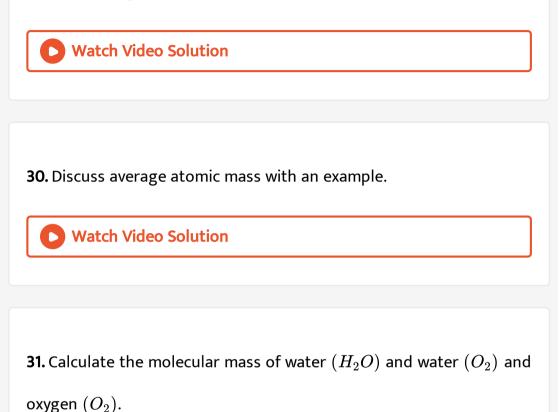
**25.** 1 M solution of  $NaNO_3$  has density 1.25 g  $cm^{-3}$ . Calculate its

molarity. (Mol. Weight of  $NaNO_3 = 85gmol^{-1}$ ).



water.

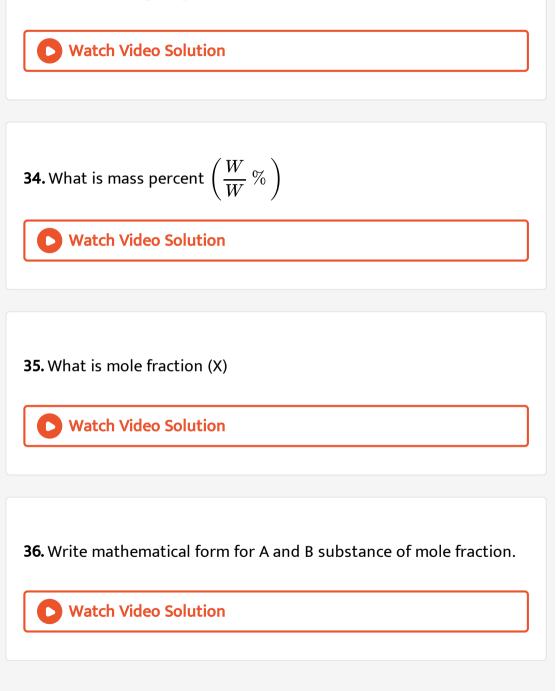
29. Define avogadro's law.





**32.** Define Avogadro constant  $(N_A)$ .

# 33. Define limiting reagent.



# 37. What is molarity (m).

**Watch Video Solution** 

**38.** What is molarity (m).



Three Marks Question With Answers

**1.** Calculate the moles of NaOH required to neutralize the solution produced by dissolving 1.1 g  $P_4O_6$  in water. Use the following reactions:

 $P_4O_6 + 6H_2O \rightarrow 4H_3PO_3, 2NaOH + H_3PO_3 \rightarrow Na_2HPO_3 + 2H_2O$ (At. Mass/g  $mol^{-1}$ P=31, O=16). **2.** (a) A sample of NaOH weighting 0.38 g is dissolved in water and the solutions is made to 50.0  $cm^3$  in a volumetric flask. What is the molarity of the solution? (b) State and explain law of multiple proportion.

Watch Video Solution

3. Calculate the amount of water (g) produced by the combustion of

16 g of methane.

Watch Video Solution

4. Explain the classification of matter

5. (a) How many significant figures are there in  $1.00 imes 10^4$ ?

(b) One mole of sugar contains...... Oxygen atoms.

(c) Give an example of moleules in which the empirical formula is  $CH_2O$  and the ratio of molecular formula weight and empirical formula weight is 6.

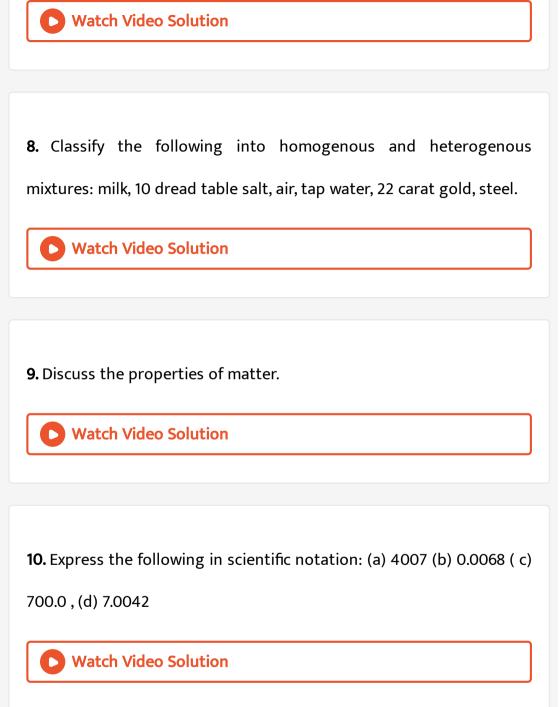


**6.** An organic monobasic acid was found to contain 39.5% carbon, 6.4% hydrogen and the rest oxygen. If the equivalent mass of the acid is 60, find out its molecular formula.



7. Calcualte the mass of  $95~\%\,$  pure  $MnO_2$  to produce 35.5 g of  $Cl_2$  as per the following reaction.  $MnO_2+4HCl o MnCl_2+Cl_2+H_2O$ 

. (At. Mass of Mn = 55).



11. Express the following S.I. bases units using power 10 notations (a)

48  $\mu g$  ,(b) 0.0426 in



**12.** Calculate the weight of CaO that can be obtained by heating 200kg of limestone which is 95% pure. (At. Mass of Ca = 40, C=12 and O=16).



**13.** 20g of sample containing  $Ba(OH)_2$  is dissolved in 10 ml of 0.5 M HCl solution. The excess of HCl was then titrated against 0.2 M NaOH. The volume of NaOH used in the titration was 10 ml. Calculate the percentage of  $Ba(OH)_2$  in the sample. (Mol. wt. of  $Ba(OH_2) = 171$ )



14. Express the following in S.I. units (a) 100 miles per hours, (b) 5 feet

# 2 inches

Watch Video Solution
<b>15.</b> Explain law of multiple proportions with example:
Watch Video Solution
<b>16.</b> Write the postulates of Daltons Atomic theory.
Watch Video Solution
<b>17.</b> Define formula mass and given an example.
<b>Vatch Video Solution</b>

18. Write the empirical formula of the compounds having molecular

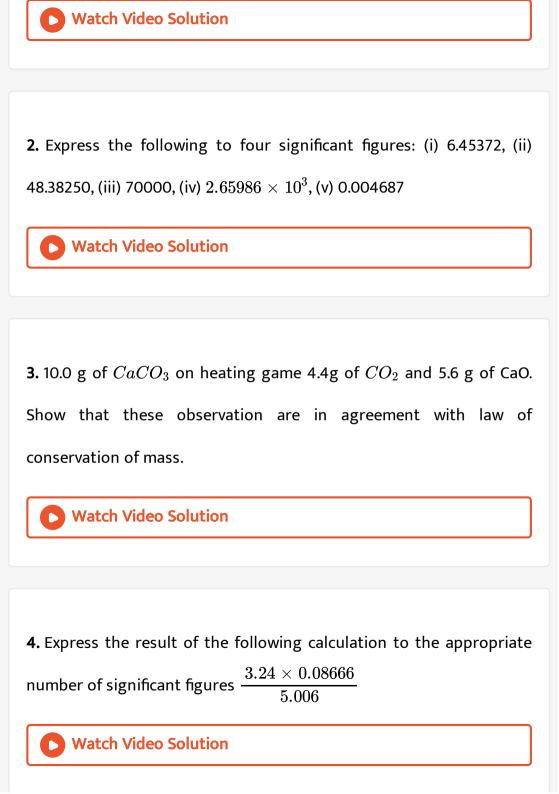
formulae.

	_
Molecular Formula	Empirical Formula
C <sub>6</sub> H <sub>6</sub> *	СН
C <sub>6</sub> H <sub>12</sub>	CH <sub>2</sub>
H <sub>2</sub> O <sub>2</sub>	НО
H <sub>2</sub> O	H <sub>2</sub> O
B <sub>2</sub> H <sub>6</sub>	BH <sub>3</sub>
N <sub>2</sub> O <sub>4</sub>	NO <sub>2</sub>
Na <sub>2</sub> CO <sub>3</sub>	Na <sub>2</sub> CO <sub>3</sub>
C <sub>2</sub> H <sub>2</sub>	СН
H <sub>3</sub> PO <sub>4</sub>	H <sub>3</sub> PO <sub>4</sub>



# Numerical Problems And Answers

**1.** How many significant figures are there in each of the following numbers? (i) 6.005, (ii)  $6.002 \times 10^{23}$ , (iii) 8000, (iv) 0.0025, (v)  $\pi$ , (vi) the sum 18.5 + 0.4235, (vii) the product  $14 \times 6.345$ 



**5.** The mass of precious stones is at present in terms of carat Given that 1 carat = 3.168 grains and 1 gram = 15.4 grains, calculate the total mass of the ring is grams and kilograms which contains 0.500 carat diamond and 7.00 gram gold.

Watch Video Solution

**6.** The graphite present in a pencil weighs is 140 mg. Calculate the number of carbon atoms in it.

Watch Video Solution

7. Calculate the percentage of the naturally occuring isotopes  ${}^{35}Cl$ and  ${}^{37}Cl$  that accounts for the atomic mass of chlorine taken as 35.45. 8. Convert 22.4 L into cubic metres.

Watch Video Solution
<b>9.</b> Calculate the molar mass of water if it contains $50~\%$ heavy water
$(D_2O).$
<b>Vatch Video Solution</b>

**10.** 60 cc of oxygen was added to 24 cc of carbon monoxide and the mixture ignited. Calculate the volume of oxygen used up nd the volume of carbon dioxide formed.

**11.**  $200cm^3$  of carbon monoxide is mixed with  $200cm^3$  of oxygen at room temperature and ignited. Calculate the vol. of  $CO_2$  formed on cooling to room temperature. What other gas if any may also be present.

Watch Video Solution

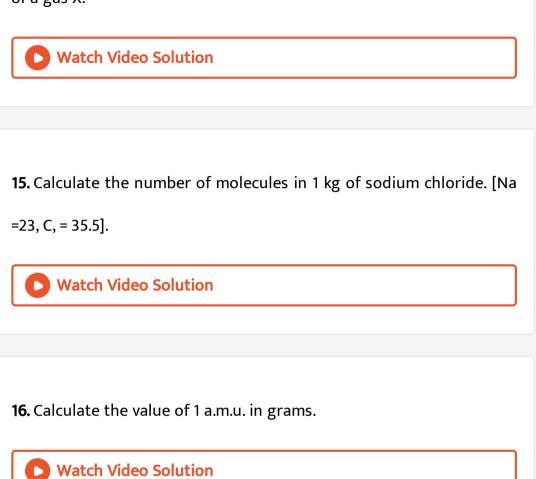
12. Calculate the volume of oxygen required to burn completely a mixture of 22.4  $dm^3$  of  $CH_4$  and 11.2  $dm^3$  of  $H_2$  (all volumes measured at STP)  $[1dm^3 = \text{litre}]$ .

Watch Video Solution

13. Calculate the mass of 50 cc of CO at STP (C=12, O=16)

14. Calculate the volumes at STP occupied by  $6.023 imes 10^{23}$  molecules

of a gas X.



17. 0.48 g of a gas forms  $100 cm^3$  of vapours at STP. Calculate the gram

molecular wt. of the gas.

18. Calculate the number of moles in the following mass (a) 7.85 g Fe

(atomic mass = 56) (b) 4.68 mg of is (at mass 28).



**19.** Calculate the normality of oxalic acid solutions containing 0.895 g crystals in  $250cm^3$  of its solutions.



**20.**  $25cm^3$  of ferrous ammonium sulphate solution require  $20cm^3$  of 0.1 N potassium dichromate solution. Calculate the amount of ferrous ammonium sulphate crystals dissolved in  $250cm^3$  of the solution. (Given equivalent).

**21.** What should be the normality of a solution prepared by diluting 250 ml of 0.4  $NH_2SO_4$  with 1000 ml of water?

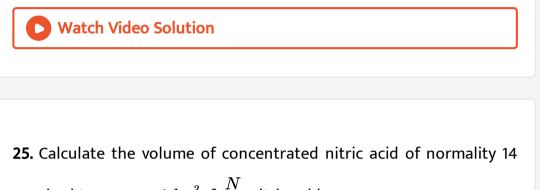


**22.**  $20cm^3$  of a solution of oxalic acid requires  $25cm^3$  of 0.2 N potassium permanganate to react completely (a) Calculate the normality of oxalic acid solutions. (b) What volume of this oxalic acid solution when made upto  $250cm^3$  gives 0.2 N solution?

Watch Video Solution

**23.**  $200cm^3$  of a solution of a dibasic acid contains 1.512 g of the acid and the normality of the solution is 0.12. Calculate (i) the equivalent mass and (ii) the molecular mass of the acid. 24. Calculate the mass of 3.5 gram atom of calcium. Atomic mass of

calcium is 40



required to prepare  $1 dm^3$ of  $rac{N}{10}$  nitric acid.

Watch Video Solution

**26.** Calculate the mass of hydrochloric acid in  $200cm^3$  of 0.2 N solution of it. What volume of this acid solution will react exactly with  $25cm^3$  of 0.14 N solution of sodium hydroxide?



**27.** 0.99 g of an acid was dissolved in water and the solution made up to  $200cm^3$ ,  $20cm^3$  of this solution required 15  $cm^3$  of 0.105 N sodium hydroxide solution for complete neutralization. Find the equivalent mass of the acid.

**28.** Calculate the mass of 2.5 gram molecular of water  $(H_2O)$ 

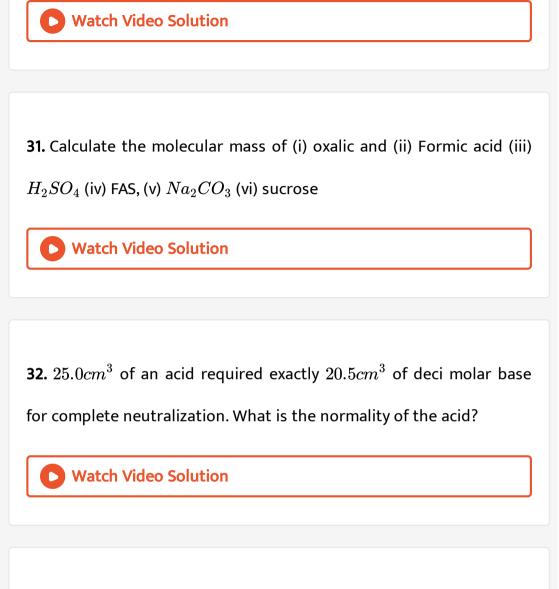
Watch Video Solution

Watch Video Solution

**29.** Calculate the mass of one molecule of methane  $(CH_4)$ .



**30.** Find the Molarity of Hydrochloric acid containing 31.5 % of hydrochloric acid. Its specific gravity is 1.16.



**33.** Exactly  $20.0cm^3$  of nitric acid neutralized  $28.4cm^3$  of 0.25 M NaOH.

What is the molarity of the acid?



**34.** 18.5  $cm^3$  of oxalic acid was completely neutralised by  $20.0cm^3$ , 0.125 N base. Calculate the (a) normality (b) molarity and ( c) mass of oxalic acid crystals in 1  $dm^3$  of solution.



**35.** Calculate the number of moles of atoms in 10.2 g of sodium.

Watch Video Solution

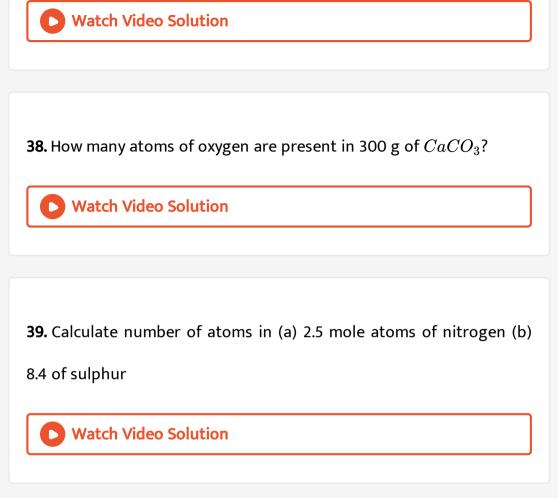
36. Calculate the number of moles in (a) 10 g of Hydrogen molecules

(b) 30 g of  $H_2O$ 



37. Calculate the mass of the following is grams (a) 5.4 moles of  $O_2$ 

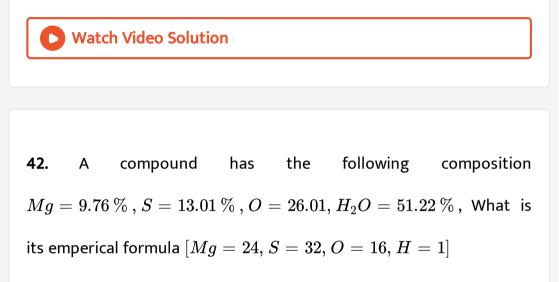
(b) 2.5 moles of  $CO_2$ , ( c) 4.2 mole of nitrogen atoms.



40. Calculate the number of molecules in each of the following (a) 24

g of nitrogen (b) 8.0 g of  $H_2S$ .

**41.** A substances on analysis for the following percentage composition the formula composition: Na = 43.4 %, C = 11.3 %, O= 45.3%. Calculate the emperical formula [Na = 23, C=12, O=16]



## Watch Video Solution

**43.** A compound has the following percentage composition. Carbon 80%, Hydrogen 20%? If the molecular mass is 30, Calculate the molecular formula.

**44.** An organic compound on analyis found to contain 92.3 % carbon and 7.7% hydrogen. It vapour density is 39. Find its molecular formula.



**45.** 4.2 g of Mg is burnt in 4.8 g of slushy to form magnesium sulphide.What is the limiting reagent? Calculate the amount of the reactions which remain unreached.



**46.** 50.0 kg of  $N_2(g)$  and 10.0 kg of  $H_2$  (g) are mixed, to produce  $NH_3(g)$ . Calculate the  $NH_3(g)$ . Formed. Identify the limiting reagent in the production of  $NH_3$  in this situation.



**47.** Commercially available conc. HCl contains 38% HCl by mass. (a) What is the molarity of this solutions. The density is 1.10 g ML-1? (b) What volume of conc. HCl is resumed to make 1.00 L of 0.10 M HCl?



**48.** How many grams of oxgyen  $(O_2)$  are required to completely react with 0.300 gof hydrogen  $(H_2)$  to yield  $H_2O$ ? Also calculate the amount of water formed.

 $2H_2+O_2
ightarrow 2H_2O$ 



49. What is the volume of oxygen at STP can be produced by 8.1 g of

potassium chlorate according to the reaction  $2KCl_3 
ightarrow 2KCl + 3O_2?$ 

