



CHEMISTRY

NCERT - FULL MARKS CHEMISTRY(TAMIL)

CHEMICAL CALCULATION

Solved Problem

1. Calculate the formula weight of compounds NaOH



Watch Video Solution

2. What is the mass in grams of a chlorine atom, Cl?



Watch Video Solution

3. What is the mass in grams of a hydrogen chloride, HCl?



Watch Video Solution

4. ZnI_2 , can be prepared by the direct combination of elements. A chemist determines from the amounts of elements that 0.0654 mol ZnI_2 can be formed.



Watch Video Solution

5. How many molecules are there in a 3.46 g sample of hydrogen chloride, HCl?

Note: The number of molecules in a sample is related to moles of compound ($1 \text{ mol HCl} = 6.023 \times 10^{23} \text{ HCl molecules}$). Therefore if you first convert grams HCl to moles, then you can convert moles to number of molecules).



Watch Video Solution

6. A compound has the following composition Mg = 9.76%, S = 13.01%, O = 26.01, H_2O = 51.22, what is its empirical formula?

[Mg = 24, S = 32, O = 16, H = 1]



Watch Video Solution

7. A compound on analysis gave the following percentage composition C = 54.54%, H, 9.09% O = 36.36. The vapour density of the compound was found to be 44. Find out the molecular formula of the compound.



Watch Video Solution

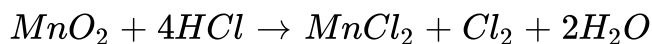
8. A compound on analysis gave the following percentage composition: Na=14.31% S = 9.97%, H = 6.22%, O = 69.5%, calculate the

molecular formula of the compound on the assumption that all the hydrogen in the compound is present in combination with oxygen as water of crystallisation. Molecular mass of the compound is 322 [Na = 23, S = 32, H = 1, O = 16].



[Watch Video Solution](#)

9. Identify the oxidising agent, reducing agent, substance oxidised and substance reduced in the following reactions.



[Watch Video Solution](#)

10. 4.5g of urea (molar mass = 60g mol^{-1}) are dissolved in water and solution is made to 100 ml in a volumetric flask. Calculate the molarity of solution.



[Watch Video Solution](#)

11. Calculate the normality of solution containing 3.15 g of hydrated oxalic acid ($H_2C_2O_4 \cdot 2H_2O$) in 250 ml of solution (Mol. Mass = 126).



[Watch Video Solution](#)

12. Calculate the molality of an aqueous solution containing 3.0g of urea (mol.mass=60) in 250g of water.



[Watch Video Solution](#)

13. What volume of 6M HCl and 2M HCl should be mixed to get one litre of 3M HCl?



[Watch Video Solution](#)

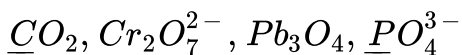
14. How much volume of 10M HCl should be diluted with water to prepare 2.00L of 5M HCl.



Watch Video Solution

Problem

1. Calculate the oxidation number of underlined elements in the following species.



Watch Video Solution

2. 0.548 g of the metal reacts with dilute acid and liberates 0.0198 g of hydrogen at S.T.P. Calculate the equivalent mass of the metal.



Watch Video Solution

3. 0.635 g of a metal gives on oxidation 0.795g g of its oxide.

Calculate the equivalent mass of the metal.



[Watch Video Solution](#)

4. In the determination of molecular mass by Victor - Meyer's Method 0.790 g of a volatile liquid displaced $1.696 \times 10^{-4} m^3$ of moist air at 303 K and at $1 \times 10^5 Nm^{-2}$ pressure. Aqueous tension at 303 K is $4.242 \times 10^3 Nm^{-2}$. Calculate the molecular mass and vapour density of the compound .



[Watch Video Solution](#)

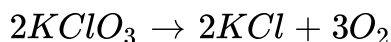
Example

1. Calculate the mass of CO_2 that would be obtained by completely dissolving 10 kg of pure $CaCO_3$ in HCl.



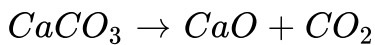
Watch Video Solution

2. Calculate the mass of oxygen obtained by complete decomposition of 10kg of pure potassium chlorate (Atomic mass K=39, O=16 and Cl = 35.5)



Watch Video Solution

3. Calculate the mass of lime that can be prepared by heating 200 kg of limestone that is 90% pure $CaCO_3$



$$100kg \times 10^{-3} \quad 56kg \times 10^{-3}$$



Watch Video Solution

Problems Of Practice

1. Calculate the formula weight of compounds NO_2



Watch Video Solution

2. Calculate the formula weight of compounds glucose ($C_6H_{12}O_6$)



Watch Video Solution

3. Calculate the formula weight of compounds NaOH



Watch Video Solution

[Watch Video Solution](#)

4. Calculate the formula weight of compounds $\text{Mg}(\text{OH})_2$



[Watch Video Solution](#)

5. Calculate the formula weight of compounds methanol (CH_3OH)



[Watch Video Solution](#)

6. Calculate the formula weight of compounds PCl_3



[Watch Video Solution](#)

7. Calculate the formula weight of compounds K_2CO_3



[Watch Video Solution](#)

8. What is the mass in grams of a calcium atom, Ca?

 Watch Video Solution

9. What is mass number of an atom?

 Watch Video Solution

10. Calculate the mass (in grams) of each of the following species.

a. Na atom b. S atom c. CH_3Cl molecule d. Na_2SO_3 formula unit

 Watch Video Solution

11. H_2O_2 is a colourless liquid. A concentrated solution of it is used as a source of oxygen for Rocket propellant fuels. Dilute aqueous solutions are used as a bleach. Analysis of a solution shows that it

contains 0.909 mol H_2O_2 in 1.00 L of solution. What is the mass of H_2O_2 in this volume of solution?.



[Watch Video Solution](#)

12. Boric acid, H_3BO_3 is a mild antiseptic and is often used as an eye wash. A sample contains 0.543 mol H_3BO_3 . What is the mass of boric acid in the sample.



[Watch Video Solution](#)

13. CS_2 is a colourless, highly inflammable liquid used in the manufacture of rayon and cellophane. A sample contains 0.0205 mol CS_2 . Calculate the mass of CS_2 in the sample.



[Watch Video Solution](#)

14. Nitric acid, HNO_3 is a colourless, corrosive liquid used in the manufacture of Nitrogen fertilizers and explosives. In an experiment to develop new explosives for mining operations, a 28.5 g sample of HNO_3 was poured into a beaker. How many moles of HNO_3 are there in this sample of HNO_3 ?



Watch Video Solution

15. Obtain the moles of substances in the following.

a. 3.43 g of C b. 7.05 g Br_2

c. 76 g C_4H_{10} d. 35.4 g Li_2CO_3

e. 2.57 g As f. 7.83 g P_4

41.4g N_2H_4 h. 153 g $Al_2(SO_4)_3$



Watch Video Solution

16. How many molecules are there in 56 mg HCN ?



Watch Video Solution

17. Calculate the following

Number of molecules in 43 g NH_3



Watch Video Solution

18. Calculate the following

Number of atoms in 7.46 g Li



Watch Video Solution

19. Calculate the following

Number of atoms in 7.46 g Li

 [Watch Video Solution](#)

20. A substance on analysis, gave the following percentage composition, Na = 43.4%, C = 11.3%, O = 43.3% calculate its empirical formula [Na = 23, C = 12, O = 16].

 [Watch Video Solution](#)

21. What is the simplest formula of the compound which has the following percentage composition: Carbon 80%, hydrogen 20%.

 [Watch Video Solution](#)

22. A compound on analysis gave the following percentage composition C = 54.54%, H, 9.09% O = 36.36. The vapour density of

the compound was found to be 44. Find out the molecular formula of the compound.



[Watch Video Solution](#)

23. An organic compound was found to have contained carbon = 40.65%, hydrogen = 8.55% and Nitrogen = 23.7%. Its vapour - density was found to be 29.5. What is the molecular formula of the compound?



[Watch Video Solution](#)

24. A compound contains 32% carbon, 4% hydrogen and rest oxygen. Its vapour density is 75. Calculate the empirical and molecular formula.



[Watch Video Solution](#)

25. An acid of molecular mass 104 contains 34.6% carbon, 3.85% hydrogen and the rest is oxygen. Calculate the molecular formula of the acid.

 [Watch Video Solution](#)

26. What is the simplest formula of the compound which has the following percentage composition: carbon 80%, Hydrogen 20%, If the molecular mass is 30, calculate its molecular formula.

 [Watch Video Solution](#)

27. Calculate the oxidation number of underlined elements in the following species.



 [Watch Video Solution](#)

28. Calculate the oxidation number of underlined elements in the following species.



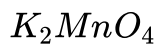
Watch Video Solution

29. Calculate the oxidation number of underlined elements in the following species.



Watch Video Solution

30. Calculate the oxidation number of underlined elements in the following species.



Watch Video Solution

31. Calculate the oxidation number of underlined elements in the following species.



Watch Video Solution

32. Balance the equations $Cr^{3+} + Na_2O_2 \rightarrow CrO_4^- + Na^+$



Watch Video Solution

33. Balance the equations $S^{2-} + NO_3^- \rightarrow NO + S$



Watch Video Solution

34. Balance the equations $FeS + O_2 \rightarrow Fe_2O_3 + SO_2$ (molecular form)



Watch Video Solution

35. Calculate the volume of 14.3m NH₃, solution needed to prepare 1L of 0.1M solution.



Watch Video Solution

36. How would you make up 425 mL of 0.150M HNO_3 from 68.0% HNO_3 ? The density of 68.0% HNO_3 is 1.41g/mL.



Watch Video Solution

37. Calculate the molarity of a solution obtained by mixing 100 mL of 0.3 M H_2SO_4 and 200 mL of 1.5M H_2SO_4



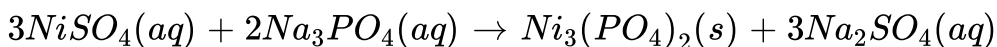
Watch Video Solution

38. Calculate the molality of a solution by dissolving 0.850g of ammonia (NH_3) in 100g of water.



Watch Video Solution

39. $NiSO_4$ reacts with Na_3PO_4 to give a yellow green precipitate of $Ni_3(PO_4)_2$ and a solution of Na_2SO_4 .

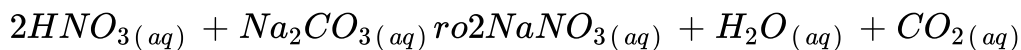


How many mL of 0.375 M $NiSO_4$ will react with 45.7 mL of 0.265M Na_3PO_4 ?



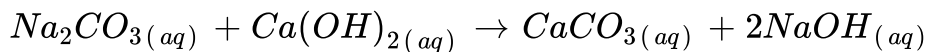
Watch Video Solution

40. What volume of 0.250 M HNO_3 reacts with 42.4 mL of 0.150 M Na_2CO_3 in the following reaction ?



Watch Video Solution

41. A flask contains 53.1 mL of 0.0150 M $Ca(OH)_2$ solution. How many mL of 0.350 M Na_2CO_3 are required to react completely with $Ca(OH)_2$ in the following reaction .



Watch Video Solution

Question Choose The Best Answer

1. The volume occupied by 16g of oxygen at S.T.P.

- A. 22.4L
- B. 44.8 L
- C. 11.2L
- D. 5.6L

Answer:



Watch Video Solution

2. Avogadro's number represents the number of atoms in

- A. 12 g of C^{12}
- B. 320 g of S
- C. 32 g of Oxygen
- D. 12.7 g of iodine.

Answer:



Watch Video Solution

3.

A. 22.4 L

B. 2.24 L

C. 11.2 L

D. 67.2 L

Answer:



Watch Video Solution

4. The number of atoms present in 0.5 gram- atoms of Nitrogen is same as the atoms in

A. 12g of C

B. 32g of S

C. 8g of the oxygen

D. 24g of magnesium

Answer:



Watch Video Solution

5. The number of gram-atoms of oxygen in 128g of oxygen is

A. 4

B. 8

C. 128

D. $8 \times 6.02 \times 10^{23}$

Answer:



Watch Video Solution

6. The total number of moles present in 111g of $CaCl_2$ is

- A. One mole
- B. Two moles
- C. Three moles
- D. Four moles

Answer:



Watch Video Solution

7. Which of the following weighs the most?

- A. One gram-atom of nitrogen
- B. One mole of water

C. One mole of Sodium

D. One molecule of H_2SO_4

Answer:



Watch Video Solution

8. Which of the following contain same number of carbon atoms as in 6g of carbon -12.

A. 6.0g ethane

B. 8.0g methane

C. 21.0g Propane

D. 28.0g CO

Answer:



Watch Video Solution

9. Which of the following contain same number of carbon atoms as in 6g of carbon -12.

A. 2.0g hydrogen

B. 2.0g oxygen

C. 2.0g nitrogen

D. 2.0g methane

Answer:



Watch Video Solution

10. Which one among the following is the standard for atomic mass?

A. H

B. $^{12}_6\text{C}$

C. $^{14}_6\text{C}$

D. $^{16}_8\text{O}$

Answer:



Watch Video Solution

11. 2.0 g of oxygen contains number of atoms same as in

A. 4g of S

B. 7g of nitrogen

C. 0.5 g of H_2

D. 12.3 g of Na

Answer:



Watch Video Solution

12. The number of molecules in 16.0 g of oxygen is :

- A. 1 gm-molecule
- B. 0.5 gm-molecule
- C. 5 gm-molecule
- D. 10 gm-molecule

Answer:



Watch Video Solution

13. Hydrogen phosphate of certain metal has a formula $MHPO_4$,
the formula of metal chloride is

- A. MCl
- B. MCl_3
- C. MCl_2

D. MCl_4

Answer:



Watch Video Solution

14. A compound contains 50% of X (atomic mass 10) and 50% Y (at. mass 20). Which formulate pertain to above date ?

A. XY

B. X_2Y

C. X_4Y_3

D. $(X_2)_3Y_3$

Answer:



Watch Video Solution

15. Which of the following compound(s) has /have percentage of carbon same as that in ethylene (C_2H_4) .

A. propene

B. Cyclohexane

C. Ethyne

D. Benzene

Answer:



Watch Video Solution

16. 5L of 0.1 M solution of sodium Carbonate contains

A. 53g of Na_2CO_3

B. 106 g of Na_2CO_3

C. 10.6 of Na_2CO_3

D. 5×10^2 millimoles of Na_2CO_3

Answer:



Watch Video Solution

Question Fill In The Blanks

1. One mole of a triatomic gas contains _____ atoms.



Watch Video Solution

2. One mole of Sulphuric acid contains _____ Oxygen atoms.



Watch Video Solution

3. 11.2 L of carbon dioxide at S.T.P contains _____ oxygen atoms.



Watch Video Solution

4. Equal volumes of all gases contain equal number of _____.



Watch Video Solution

5. A decimolar solution of NaOH contains _____ of NaOH per litre of the solution.



Watch Video Solution

6. 7 g of CO contains _____ O atoms.



Watch Video Solution

7. The mass of 1×10^{22} formula units of $CuSO_4 \cdot 5H_2O$ is _____



Watch Video Solution

Question Match The Following

1. Match the following.

Microbe	Uses
i. <i>Anabaena</i>	a. Biogas
ii. <i>Penicillium notatum</i>	b. Cheese
iii. <i>Methanobacterium</i>	c. Penicillin
iv. <i>Monascus purpureus</i>	d. Biofertiliser



Watch Video Solution

Question Answer The Following

1. Can two different compounds have same molecular formula ?

Illustrate your answer with two examples.



Watch Video Solution

2. What are the essentials of a chemical equation ?



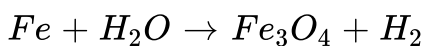
Watch Video Solution

3. What are the informations conveyed by a chemical equation ?



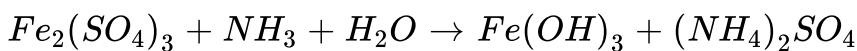
Watch Video Solution

4. Balance the following equations



Watch Video Solution

5. Balance the following equations

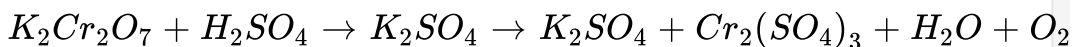


[Watch Video Solution](#)

6. Balance the following equations

[Watch Video Solution](#)

7. Balance the following equations

[Watch Video Solution](#)