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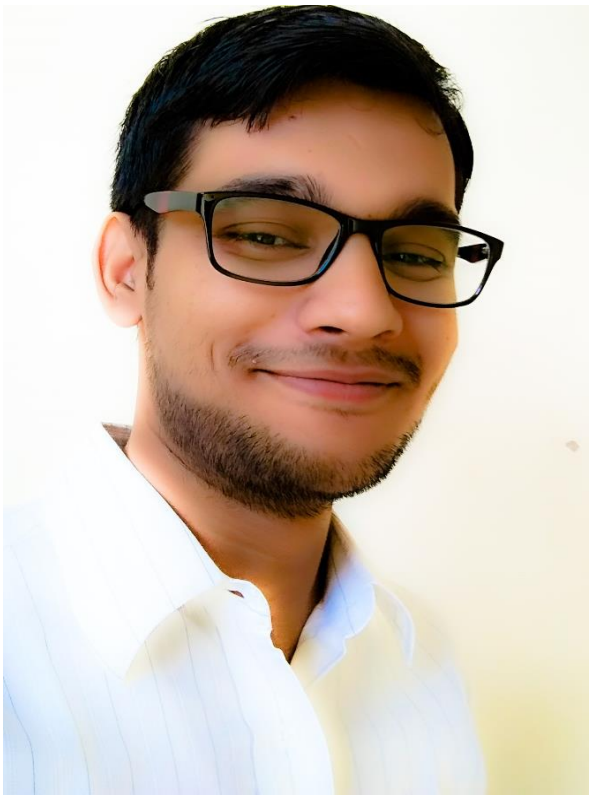
CHEMISTRY

DAILY PRACTICE PAPER

(DPP) - 1

SOME BASIC CONCEPTS OF CHEMISTRY – For Mole Concept



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DAILY PRACTICE PAPER

(DPP) - 1

SOME BASIC CONCEPTS OF CHEMISTRY – For Mole Concept

Unit - Some basic Concepts Of Chemistry **Topic - Mole Concept**

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Objective Problems

01. Mass of 1 atom of Hydrogen is
(A) 1.66×10^{-24} g (B) 10^{-22} g
(C) 10^{-23} g (D) 10^{-25} g

02. Which of the following contains the largest number of atoms
(A) 11g of CO_2 (B) 4g of H_2
(C) 5g of NH_3 (D) 8g of SO_2

03. Four containers of 2L capacity contains dinitrogen as described below. Which one contains maximum number of molecules under similar conditions.
(A) 2.5 gm-molecules of N_2
(B) 4 gm-atom of nitrogen
(C) 3.01×10^{24} N atoms
(D) 84 gm of dinitrogen

04. What is correct for 10 g of $CaCO_3$
(A) It contains 1g-atom of carbon
(B) It contains 0.3 g-atoms of oxygen
(C) It contains 12 g of calcium
(D) None of these

05. The total number of electrons present in 18 mL water (density 1 g/mL) is
(A) 6.023×10^{23} (B) 6.023×10^{24}
(C) 6.023×10^{25} (D) 6.023×10^{21}

06. 4.0 g of caustic soda (mol mass 40) contains same number of sodium ions as are present in
(A) 10.6 g of Na_2CO_3 (mol. mass 106)
(B) 58.5 g of NaCl (Formula mass 58.5)
(C) 100 ml of 0.5 M Na_2SO_4 (Formula mass 142)
(D) 1mol of $NaNO_3$ (mol. mass 85)

07. No. of oxalic acid molecules in 100 ml of 0.02 N oxalic acid is
(A) 6.023×10^{20} (B) 6.023×10^{21}
(C) 6.023×10^{22} (D) 6.023×10^{23}

08. One atom of an element 'X' weighs 6.664×10^{-23} gm. The number of gram atoms in 40 kg of it is
(A) 10 (B) 100 (C) 10000 (D) 1000

09. The number of oxygen atoms present in 14.6 g of magnesium bicarbonate $[Mg(HCO_3)_2]$ is
(A) $6N_A$ (B) $0.6N_A$ (C) N_A (D) $0.5\ N_A$

10. Number of Ca^{+2} and Cl^- ion in 111 g of anhydrous $CaCl_2$ are
(A) N_A, $2N_A$ (B) $2N_A$, N_A
(C) N_A, N_A (D) None

11. One mole of P_4 molecules contains
(A) 1 molecule
(B) 4 molecules
(C) $1/4 \times 6.022 \times 10^{23}$ atoms
(D) 24.088×10^{23} atoms

12. The total number of protons , electrons and neutrons in 12gm of $_6C^{12}$ is
(A) 1.084×10^{25} (B) 6.022×10^{23}
(C) 6.022×10^{22} (D) 18

13. The number of sodium atoms in 2 moles of sodium ferrocyanide $Na_4[Fe(CN)_6]$, is
(A) 2 (B) 6.023×10^{23}
(C) $8 \times 6.02 \times 10^{23}$ (D) $4 \times 6.02 \times 10^{23}$

14. Out of 1.0 g dioxygen, 1.0 g (atomic) oxygen and 1.0 g of ozone, the maximum number of oxygen atoms are contained in
(A) 1.0 g of atomic oxygen.
(B) 1.0 g of ozone.
(C) 1.0 g of oxygen gas.
(D) All contain same number of atoms.

15. 2 moles of H_2 at NTP occupy a volume of
(A) 11.2 litre (B) 44.8 litre
(C) 2 litre (D) 22.4 litre

16. 4.48 litres of methane at N.T.P. correspond to
(A) 1.2×10^{22} molecules of methane
(B) 0.5 mole of methane
(C) 3.2 gm of methane
(D) 0.1 mole of methane

17. The weight of a substance that displaces 22.4 litre air at NTP is
(A) Mol. wt. (B) At. wt.
(C) Eq. wt. (D) all

18. Mol. wt. = vapour density × 2, is valid for
(A) metals (B) non metals
(C) solids (D) gases

19. 5.6 litre of a gas at N.T.P. weighs equal to 8 gm the vapour density of gas is
(A) 32 (B) 16 (C) 8 (D) 40.

20. The maximum volume at N.T.P. is occupied by
(A) 12.8 gm of SO_2
(B) 6.02×10^{22} molecules of CH_4
(C) 0.5 mol of NO_2
(D) 1 gm-molecule of CO_2

21. Equal masses of O_2 , H_2 and CH_4 are taken in a container. The respective mole ratio of these gases in container is
(A) 1 : 16 : 2 (B) 16 : 1 : 2
(C) 1 : 2 : 16 (D) 16 : 2 : 1

22. Number of moles of water in 488 gm of $BaCl_2.2H_2O$ are - (Ba = 137)
(A) 2 moles (B) 4 moles
(C) 3 moles (D) 5 moles

23. 16 gm of SO_x occupies 5.6 litre at STP. Assuming ideal gas nature, the value of x is
(A) 1 (B) 2 (C) 3 (D) None of these

24. The density of air is 0.001293 gm/ml at S.T.P. It's vapour density is
(A) 143 (B) 14.3 (C) 1.43 (D) 0.143

25. Which one of the following properties of an element is not variable
(A) Valency (B) Equivalent mass
(C) Atomic mass (D) All the three

26. An element A is tetravalent and another element B is divalent. The formula of the compound formed from these elements will be
(A) A_2B (B) AB (C) AB_2 (D) A_2B_3

27. The vapour density of gas A is four times that of B. If molecular mass of B is M, then molecular mass of A is
(A) M (B) 4M (C) $\frac{M}{4}$ (D) 2M

28. If one mole of ethanol (C_2H_5OH) completely burns to form carbon dioxide and water, the weight of carbon dioxide formed is about
(A) 22gm (B) 45gm (C) 66gm (D) 88gm

29. If LPG cylinder contains mixture of butane and isobutane, then the amount of oxygen that would be required for combustion of 1kg of it will be
(A) 1.8 kg (B) 2.7 kg
(C) 4.5 kg (D) 3.58 kg

30. 1 gm - atom of nitrogen represents
(A) 6.02×10^{23} N_2 molecules
(B) 22.4 lit. of N_2 at N.T.P.
(C) 11.2 lit. of N_2 at N.T.P.
(D) 28 gm of nitrogen.

31. If isotopic distribution of C–12 and C–14 is 98% and 2% respectively, then the number of C–14 atoms in 12 gm of carbon is
(A) 1.032×10^{22} (B) 3.01×10^{22}
(C) 5.88×10^{23} (D) 6.02×10^{23}

32. If 3.01×10^{20} molecules are removed from 98 mg of H_2SO_4, then the number of moles of H_2SO_4 left are
(A) 0.1×10^{-3} (B) 0.5×10^{-3}
(C) 1.66×10^{-3} (D) 9.95×10^{-2}

33. Total number of atoms of all elements present in 1 mole of ammonium dichromate $[(NH_4)_2Cr_2O_7]$ is
(A) 14 (B) 19
(C) 6×10^{23} (D) 114×10^{23}

34. How many grams are contained in 1gm-atom of Na
(A) 13gm (B) 23gm (C) 1gm (D) 1/23gm

35. Total no. of atoms in 44 gm of CO_2 is
(A) 6.02×10^{23} (B) 6.02×10^{24}
(C) 1.806×10^{24} (D) 18.06×10^{22}

36. If the density of water is 1 gm/cm^3, then the volume occupied by one molecule of water is approximately
(A) 18 cm^3 (B) 22400 cm^3
(C) 6.02×10^{-23} cm^3 (D) $3.0 \times 10^{-23} cm^3$

37. What mass of calcium chloride in grams would be enough to produce 14.35 gm of AgCl.
(At. mass Ca = 40, Ag = 108)
(A) 5.55 gm (B) 8.295 gm
(C) 16.59 gm (D) 11.19 gm

38. 8 gm of O_2 has the same number of molecules as
(A) 7 gm of CO (B) 14 gm of CO
(C) 14 gm of CO_2 (D) 12 gm of CO_2

39. 4.4 gm of CO_2 and 2.24 litre of H_2 at STP are mixed in a container. The total number of molecules present in the container will be
(A) 6.022×10^{23} (B) 1.2044×10^{23}
(C) 2 moles (D) 6.023×10^{24}

40. A sample of AlF_3 contains 3.0×10^{24} F^- ions. The number of formula units in this sample are
(A) 9.0×10^{24} (B) 3.0×10^{24}
(C) 0.75×10^{24} (D) 1.0×10^{24}

41. Calculate the gm quantity of Na_2CO_3 which has same No. of atoms as the No. of protons present in 10 gm $CaCO_3$
(A) 20gm (B) 88.33gm
(C) 44gm (D) 60gm

42. Avogadro's number of Rupees can be spent in .....years if 10 lac rupees per second are spent
(A) 1.91×10^{10} year (B) 2.91×10^{10} year
(C) 3.91×10^{10} year (D) 4.91×10^{10} year

43. The amount of sulphur required to produce 100 moles of H_2SO_4 is
(A) 3.2×10^3 gm (B) 32.65 gm
(C) 32 gm (D) 3.2 gm

44. The law of conservation of mass holds good for all of the following except
(A) All chemical reactions
(B) Nuclear reactions
(C) Endothermic reactions
(D) Exothermic reactions

45. A compounds was found to contain 5.37% nitrogen. What is the minimum molecular wt. of compound
(A) 26.07gm (B) 2.607gm
(C) 260.7gm (D) none

Subjective Problems

01. Calculate the no. of molecules in a drop of water weighing 0.07 g.

Ans. 2.34×10^{21} molecules of H_2O

02. Calculate no. of each atom present in 106.5 g of $NaClO_3$.

Ans. 6.023×10^{23} atom Na,
6.023×10^{23} atom Cl,
18.06×10^{23} atom O

03. Find the no. of mole of phosphorus in 92.9 g of phosphorus assuming that molecular formula of phosphorus in P_4. Also determine the no. of atoms and molecules of phosphorus in the sample.

Ans. 0.75 mol,
4.52×10^{23} molecules P_4 ,
18.04×10^{23} atom P

04. Calculate the number of moles in 5.75 g of sodium. (Atomic mass of sodium = 23.)

Ans. 0.25 mol

05. How many grams of each of the following elements must be taken to get 1 mol of the element?
(a) Sodium (b) Chlorine (c) Copper

Ans. (a) 23 g (b) 35.5 g (c) 63.5 g

06. The density of liquid mercury is 13.6 / cm^3. How many moles of mercury are there in 1 litre of the metal ? (Atomic mass of Hg = 200)

Ans. 68

07. 50 g of $CaCO_3$ is allowed to react with 70 g of H_3PO_4. Calculate
(i) amount of $Ca_3 (PO_4)_2$ formed
(ii) amount of unreacted reagent

Ans. (i) 51.66 g (ii) 37.31 g

08. N_2H_4, Hydrazine a rocket fuel can be produced according to the following reaction
$ClNH_2 + 2NH_3 \longrightarrow N_2H_4 + NH_4Cl$ When 1000g $ClNH_2$ is reacted with excess of NH_3, 473g N_2H_4 is produced. What is the % yield of the reaction.

Ans. 76.12%

09. Carbon disulphide 'CS_2', can be made from by product SO_2. The overall reaction is
$5C + 2SO_2 \longrightarrow CS_2 + 4CO$ How much CS_2 can be produced from 450 kg of waste SO_2 with excess of coke if the SO_2 conversion is 82%.

Ans. 219.09 kg CS_2

10. Calculate the percent of BaO in 29.0 g of a mixture of BaO and CaO which just reacts with 100.8 mL of 6.00 M HCl.
$BaO + 2HCl \rightarrow BaCl_2 + H_2O$
$CaO + 2HCl \rightarrow CaCl_2 + H_2O$

Ans. 65.65%

11. Calculate the amount of 95% pure Na_2CO_3 required to prepare 5 litre of 0.5 M solution.

Ans. 278.94 g

12. Calculate the molality of a sulphuric acid solution of specific gravity 1.2 containing 27% H_2SO_4 by weight.

Ans. 3.8

13. A gaseous alkane is exploded with oxygen. The moles of O_2 for complete combustion and CO_2 formed is in the ratio 7 : 4. Deduce molecular formula of alkane.

Ans. C_2H_6

14. When 2.86 g of a mixture of 1-butene, C_4H_8 and butane C_4H_{10} was burned in excess of oxygen, 8.80 g of CO_2 and 4.14 g of H_2O were obtained. What is percentage by mass of butane in the mixture.

Ans. 60.8 %

15. If v mL of a gaseous hydrocarbon, after explosion with excess of oxygen, showed a contraction of 2.5 v mL and a further contraction of 2v mL with caustic potash, Find the formula of hydrocarbon.

Ans. C_2H_6

16. The average mass of one gold atom in a sample of naturally occuring gold is 3.2707×10^{-22} g. Use this to calculate the molar mass of gold.

Ans. 196.2

17. A plant virus is found to consist of uniform symmetrical particles of 150 Å in diameter and 5000 Å long. The specific volume of the virus is 0.75 cm^3/g. If the virus is considered to be a single particle, find its molecular weight.

Ans. 7.09×10^7

18. $A_2 + 2B_2 \longrightarrow A_2B_4$ $\quad \frac{3}{2}A_2 + 2B_2 \longrightarrow A_3B_4$

Two substance A_2 & B_2 react in the above manner when A_2 is limited it gives A_2B_4 in excess gives A_3B_4. A_2B_4 can be converted to A_3B_4 when reacted with A_2. Using this information calculate the composition of the final mixture when the mentioned amount of A & B are taken :c
(a) 4 moles A_2 & 4 moles B_2
(b) $\frac{1}{2}$ moles A_2 & 2 moles B_2
(c) 1.25 moles A_2 & 2 moles B_2

Ans. (a) $A_3B_4 = 2$ & $A_2 = 1$
(b) $A_2B_4 = \frac{1}{2}$ & $B_2 = 1$
(c) $A_2B_4 = 0.5$ & $A_3B_4 = 0.5$

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ANSWER KEYS

Chapter – Some Basic Concepts of Chemistry

Topic – Mole Concept

DPP – 1

Q.	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Ans.	A	B	D	B	B	C	A	D	B	A	D	A	C	D	B
Q.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	C	A	D	B	D	A	B	B	B	C	C	B	D	D	C
Q.	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans.	A	B	D	B	C	D	A	A	B	D	B	B	A	B	C

Thank you for your love and support, we hope you are always being happy and get success in your life, we are happy to see you again.

Regards from Learnaf team