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## CHEMISTRY

## VMC MODULES ENGLISH

## SOME BASIC CONCEPTS OF CHEMISTRY

## Illustration

1. In an experiment, 2.4 g of Iron oxide on reduction with Hydrogen yields
1.68 g of Iron. In another experiment, 2.9 g of Iron oxide give 2.03 g of Iron on reduction with Hydrogen. Show that the above data illustrates the law of constant proportion.
2. 100 g of mercuric oxide is heated and decomposed to produce 7.4 g of oxygen. What mass of mercury must be produced in the reaction?

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3. 1.375 g of cupric oxide was reduced by heating in a current of hydrogen and the weight of copper that remained was 1.098 g In another experiment, 1.179 g of copper was dissolved in nitric acid and the resulting copper nitrate converted into cupric oxide by ignition. The weight of cupric oxide formed was 1.476 g . Show that these result illustrate the law of constant composition.

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4. metal combines with oxygen to form two oxides, having the following composition:
(i) $0.398 g$ of the first metal oxide contains $0.318 g$ of metal.
(ii) $0.716 g$ of the second oxide contains $0.636 g$ of the metal.

Show that the above data agrees with the law of multiple proportions.

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5. Hydrogen combines with oxygen and forms two compounds. In the first compound, hydrogen content is $5.93 \%$ while in the other compound it is $11.2 \%$. Verify whether the data agrees with law of multiple proportions.

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6. 30 g of solute are added to 120 g of solution. Calculate the mass percentage of solution.

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7. Carbon found in nature as a mixture of $\mathrm{C}-12$ and $\mathrm{C}-13$. The average atomic mass of carbon is 12.011 u . What is the percentage abundance of

## carbon-12 in nature?

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8. Mass of an atom of an element $X$ is $2.66 \times 10^{-23} \mathrm{~g}$. How can this mass be expressed in terms of amu?

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9. There are two isotopes of an element with atomic mass z. Heavier one has atomic mass $z+2$ and lighter one has $z-1$, then abundance of lighter one is

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10. What will be the mass of one molecule of $\mathrm{CaCl}_{2}$ in grams?
11. If the mass of a sample of $\mathrm{Na}_{2} \mathrm{SO}_{4}$ is 7.1 g , then how many molecules of $\mathrm{Na}_{2} \mathrm{SO}_{4}$ must be present in the sample ?

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12. There are $1.52 \times 10^{30}$ molecules of $\mathrm{H}_{2} \mathrm{SO}_{4}$ in a vessel, how many kilograms of $\mathrm{H}_{2} \mathrm{SO}_{4}$ would that be?

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13. What will be the mass of $1.5 g$ - molecule of Sulphuric acid ?

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14. How many molecules and atoms of Oxygen are present in 5.6 litres of Oxygen $\left(O_{2}\right)$ at NTP?
15. One litre of mixture of CO and $\mathrm{CO}_{2}$ is passed through red hot charcoal in tube. The new volume becomes 1.4 litre. Find out \% composition of mixture by volume. All measurements are made at same $P$ and $T$

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16. A mixture of $\mathrm{H}_{2} \mathrm{C}_{2} \mathrm{O}_{4}$ and HCOOH is heated with conc $\mathrm{H}_{2} \mathrm{SO}_{4}$. The gas produced is collected and on treatment with KOH solution, the volume of the gas decreases by $\frac{1}{6}$ calculate the molar ratio of the two acids in the original mixture.

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17. 3 L mixture of propane and butane on complete combustion at 298 K gave 10 LCO 2 Calculate the compostion of the gas mixture.
18. Hydrogen and Oxygen are combined in the ratio $1: 16$ by mass in Hydrogen peroxide. Calculate the percentage of Hydrogen and Oxygen in Hydrogen peroxide.

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19. Two Oxides of a metal contain 30.0 and 27.6 per cent of Oxygen respectively. If the formula of the first Oxide be $M_{2} O_{3}$, find that of the second oxide.

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20. A compound contains $34.8 \%$ Oxygen, $52.2 \%$ carbon and $13.0 \%$ Hydrogen. What is the empirical formula of the compound?

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21. A compound of carbon, hydrogen, and nitrogen contains the three elements in the respective ratio of $9: 1: 3.5$ Calculculate the empirical formula. If the molecular weight of the compound is 108 , what its molecular formula?

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22. 100ml of a mixture of $\mathrm{CH}_{4}$ and $\mathrm{C}_{2} \mathrm{H}_{4}$ were exploded with excess of oxygen. After explosion and cooling, the mixture was treated with KOH , where a reduction of 165 ml was observed. Find the composition of the mixture taken ?

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23. What will be the maximum mass of water that can be produced when

2 grams of hydrogen and 10 grams of oxygen are reacted ?
24. If 6 litre of Nitrogen and 10 litre of hydrogen are taken in a reactor and the reaction achieves $50 \%$ completion, then what will be the final volume of gases in the vessel ?

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25. $1.878 g$ of $M B r_{X}$ when heated in a stream of HCl gas was completely converted to chloride $M C l_{X}$ which weighed $1.0 g$ The specific heat of metal is $0.14 \mathrm{calg}^{-1}$. Calculate the molecular weight of the metal bromide.

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26. 1.67 g mixture of Al and Zn was completely dissolved in acid and evolved 1.69 L of $\mathrm{H}_{2}$ at STP. Calculate the weight Al and Zn in the mixture.

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27. Gastric juice contains about 3.0 g HCl per litre. If a person produces about 2.5 L of gastric juice per day, how many antacid tablets each containing 400 mg of $\mathrm{Al}(\mathrm{OH})_{3}$ are needed to neutralise all the HCl produced in one day.

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28. 0.05 g of a sample of $\mathrm{KClO}_{3}$ containing some KCl on decomposition liberated just sufficient oxygen for complete oxidation of 20 mL of " CO . The volume of CO was measured at $27^{\circ} \mathrm{C}$ and 750 mm Hg . Calculate the perentage purity of $\mathrm{KClO}_{3}$.

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29. NaCl of $95 \%$ purity is used to prepare salt cake $\left(\mathrm{Na}_{2} \mathrm{SO}_{4}\right)$ by the reaction,
$2 \mathrm{NaCl}+\mathrm{H}_{2} \mathrm{SO}_{4} \rightarrow \mathrm{Na}_{2} \mathrm{SO}_{4}+2 \mathrm{HCl}$.

If the product $\left(\mathrm{Na}_{2} \mathrm{SO}_{4}\right)$ is only $85 \%$ pure, what weight of NaCl is used up in producing 1 kg of the impure salt cake ?

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30. A sample of clay was partially dried. It then contained $50 \%$ slica and $7 \%$ water. The original clay contained $12 \%$ water find the percentage of silica in the original sample

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31. The oxide of an element contains 32.33 percent of the element and the vapour density of its Chloride is 79 . Calculate the atomic mass of the element.

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32. Mole fraction of ethanol in ethanol water mixture is 0.25 . Hence, the percentage concentration of ethanol by weight of mixture is

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33. Calculate the volume of $8 \%$ by mass solution of $\mathrm{NaOH}\left(d=1.34 \mathrm{~g} / \mathrm{cm}^{3}\right)$ to prepare 500 ml of $4 \%$ by mass solution of $\mathrm{NaOH}\left(d=1.24 \mathrm{~g} / \mathrm{cm}^{3}\right)$.

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34. If the mole fraction of lodine in benzene is 0.25 , then what will be the molality of the solution?

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35. When 400 g of a $20 \%$ Solution was cooled 50 g of the solute precipitated. What is the percent concentration of the remaining solution.

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36. A solution is obtained by mixing 300 g of $25 \%$ solution ad 400 g of $40 \%$ solution by mass. Calculate the mass percentage of the resulting solution.

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37. Calculate the oxidation state of the underlined atoms in the given species.
(a) $\mathrm{NO}_{2}^{+}$

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38. Calculate the oxidation state of the underlined atoms in the given species.
(b) $\mathrm{NO}_{3}^{-}$

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39. Calculate the oxidation state of the underlined atoms in the given species.
(c) $\mathrm{K}_{\underline{M} n O_{4}}$

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40. Calculate the oxidation state of the underlined atoms in the given species.
(d) $\underline{C} r_{2} O_{7}^{2-}$
41. Calculate the oxidation state of the underlined atoms in the given species.
(e) $\underline{\mathrm{F}} e_{2} \mathrm{O}_{3}$

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42. The oxidation state of Fe in $\mathrm{Fe}_{3} \mathrm{O}_{4}$ is :

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43. Calculate the n - factor of reactants in the given chemical changes?
(a) $\mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7} \xrightarrow{\mathrm{H}^{+}} \mathrm{Cr}^{+3}$

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44. Calculate the n - factor of reactants in the given chemical changes?
(b) $\mathrm{C}_{2} \mathrm{O}_{4}^{2-} \rightarrow \mathrm{CO}_{2}$
45. Calculate the n - factor of reactants in the given chemical changes?
(c) $\mathrm{S}_{2} \mathrm{O}_{3}^{2-} \xrightarrow{\text { alkaline }} \mathrm{SO}_{4}^{2-}$

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46. Calculate the n - factor of reactants in the given chemical changes?
(d) $I^{-} \rightarrow I C l$

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47. Calculate the $n$-factor of reactants in the given chemical changes?
(a) $\mathrm{S}_{2} \mathrm{O}_{3}^{2-} \xrightarrow{\text { acidic }} \mathrm{S}_{4} \mathrm{O}_{6}^{2-}$
48. Calculate the n -factor of reactants in the given chemical changes?
(b) $I^{-} \rightarrow I_{2}$

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49. Calculate the n -factor of reactants in the given chemical changes?
(c) $\mathrm{IO}_{3}^{-} \rightarrow \mathrm{ICl}$

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50. Calculate the n -factor of reactants in the given chemical changes?
(d) $\mathrm{FeSO}_{4} \rightarrow \mathrm{Fe}_{2} \mathrm{O}_{3}$

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51. Calculate the $n$-factor of reactants in the given chemical changes
(a) $\mathrm{PH}_{3} \rightarrow \mathrm{H}_{3} \mathrm{PO}_{3}$
52. Calculate the $n$-factor of reactants in the given chemical changes
(b) $\mathrm{CuS} \rightarrow \mathrm{Cu}^{2+}+\mathrm{SO}_{2}$

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53. Calculate the $n$-factor of reactants in the given chemical changes
(c) $\mathrm{NO}_{3}^{-} \rightarrow \mathrm{N}_{2} \mathrm{O}$

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54. Calculate the $n$-factor of reactants in the given chemical changes
(e) $\mathrm{As}_{2} \mathrm{O}_{3} \rightarrow A s_{2} \mathrm{O}_{5}$

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55. Calculate the $n$-factor of reactants in the given chemical changes
(e) $A s_{2} O_{3} \rightarrow A s_{2} O_{5}$

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56. Calculate the $n$-factor of reactants in the given reactions.
(b) $\mathrm{FeC}_{2} \mathrm{O}_{4} \rightarrow \mathrm{Fe}^{3+}+\mathrm{CO}_{2}$

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57. Calculate the n-factor of reactants in the given reactions.
(b) $\mathrm{FeC}_{2} \mathrm{O}_{4} \rightarrow \mathrm{Fe}^{3+}+\mathrm{CO}_{2}$

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58. Calculate the $n$-factor of reactants in the given reactions.
(c ) $\left[\mathrm{Fe}(\mathrm{CN})_{6}\right]^{4-} \rightarrow \mathrm{Fe}^{3+}+\mathrm{CO}_{2}+\mathrm{NO}_{3}^{-}$
59. Calculate the n -factor of reactants in the given reactions.
(d) $\mathrm{Fe}\left(\mathrm{NO}_{3}\right)_{3} \rightarrow \mathrm{Fe}^{2+}+\mathrm{NO}$

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60. Calculate the $n$-factor of reactants in the given reactions.
(e) $\mathrm{Fe}_{2}\left(\mathrm{SO}_{4}\right)_{3} \rightarrow \mathrm{Fe}^{2+}+\mathrm{SO}_{2}$

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61. Calculate the n -factor of reactants in the given reactions.
(b) $\mathrm{FeC}_{2} \mathrm{O}_{4} \rightarrow \mathrm{Fe}^{3+}+\mathrm{CO}_{2}$

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62. Calculate the n - factor of reactants in the given chemical changes?
(a) $\mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7} \xrightarrow{\mathrm{H}^{+}} \mathrm{Cr}^{+3}$

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63. Calculate n factor of $\mathrm{HCuCl}_{2}$ in the given reaction, $2 \mathrm{HCuCl}_{2} \xrightarrow[\mathrm{H}_{2} \mathrm{O}]{\text { dil. With }} \mathrm{Cu}+\mathrm{Cu}^{+2}+4 \mathrm{Cl}^{-}+2 \mathrm{H}^{+}$.

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64. Which of the following reactions are exothermic?
A. $\mathrm{C}+\mathrm{O} 2 \rightarrow \mathrm{CO} 2$
B. $2 \mathrm{Mg}+\mathrm{O} 2 \rightarrow 2 \mathrm{MgO}$
C. $\mathrm{CuSO} 4+5 \mathrm{H} 2 \mathrm{O} \rightarrow \mathrm{CuSO} 4.5 \mathrm{H} 2 \mathrm{O}$
D. All the above

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65. A 10.0 ml of $\left(\mathrm{NH}_{4}\right)_{2} \mathrm{SO}_{4}$ solution was treated with excess of NaOH . The ammonia evolved was absorbed in 50 ml of 0.1 N HCl . The excess HCl required 20 ml of $0.1 \mathrm{~N} . \mathrm{NaOH}$. Calculate the strength of $\left(\mathrm{NH}_{4}\right)_{2} \mathrm{SO}_{4}$ in the solution.

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66. Why is propane stored in household tanks but natural gas is not?

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67.0.7 grams of $\mathrm{Na}_{2} \mathrm{CO}_{3} . x \mathrm{H}_{2} \mathrm{O}$ were dissolved in water and the volume was made to $100 \mathrm{~mL}, 20 \mathrm{~mL}$ of this solution required 19.8 mL of $\mathrm{N} / 10 \mathrm{HCl}$ for complete neutralization. The value of x is Report your answer by rounding it upto nearest whole number.
68. $3.4 g$ sample of $\mathrm{H}_{2} \mathrm{O}_{2}$ solution containing $x \% \mathrm{H}_{2} \mathrm{O}_{2}$ by weight requires $x m L o f a \mathrm{KMnO}_{4}$ solution for complete oxidation under acidic condition. The normality of $\mathrm{KMnO}_{4}$ solution is

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69. Why is mass conserved in chemical reactions?

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70. A $5-0 \mathrm{~cm}^{3}$ solutions of $\mathrm{H}_{2} \mathrm{O}_{2}$ liberates of 0.508 g of iodine from acidified KI solution. Calculate the volume strength of $\mathrm{H}_{2} \mathrm{O}_{2}$ at N.T.P.

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1. The mass of $83.4 \%$ pure salt cake $\left(\mathrm{Na}_{2} \mathrm{SO}_{4}\right)$ that can be produced from 250 kg of $94.5 \%$ pure salt in the reaction $2 \mathrm{NaCl}+\mathrm{H}_{2} \mathrm{SO}_{4} \rightarrow \mathrm{Na}_{2} \mathrm{SO}_{4}+2 \mathrm{HCl}$ is :
A. 344 kg
B. 244 kg
C. 444 kg
D. 222 kg

## Answer: A

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2. 2 grams of a gas mixture of CO and $\mathrm{CO}_{2}$ on reaction with excess $\mathrm{I}_{2} \mathrm{O}_{5}$ yields 2.54 grams of $I_{2}$. What would be the mass $\%$ of CO in the original mixture?
A. 60
B. 30
C. 70
D. 35

## Answer: B

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3. The molecular formula of a commercial resin used for exchanging ions in water softening is $\mathrm{C}_{8} \mathrm{H}_{7} \mathrm{SO}_{3} \mathrm{Na}(\mathrm{mol}$. wt . 206) . What would be the maximum uptake of $\mathrm{Ca}^{2+}$ ions by the resin when expressed in mole per gram resin?
A. 0.00246
B. 0.0246
C. 0.246
D. 2.46

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4. For the reaction $\mathrm{Ba}(\mathrm{OH})_{2}+2 \mathrm{HClO}_{3} \rightarrow \mathrm{Ba}\left(\mathrm{ClO}_{3}\right)_{2}+2 \mathrm{H}_{2} \mathrm{O}$.

Calculate the number of moles of $\mathrm{H}_{2} \mathrm{O}$ formed when 0.1 mole of $\mathrm{Na}(\mathrm{OH})_{2}$ is treated with 0.0250 mole $\mathrm{HClO}_{3}$.
A. 0.1
B. 0.125
C. 0.025
D. 3.75

## Answer: C

5. Ammonia gas is passed into water, yielding a solution of density $0.93 \mathrm{~g} / \mathrm{cm}^{3}$ and containing $18.6 \% \mathrm{NH}_{3}$ by weight. The mass of $\mathrm{NH}_{3}$ per cc of the solution is
A. $0.17 \mathrm{~g} / \mathrm{cm}^{3}$
B. $0.34 \mathrm{~g} / \mathrm{cm}^{3}$
C. $0.51 \mathrm{~g} / \mathrm{cm}^{3}$
D. $0.68 \mathrm{~g} / \mathrm{cm}^{3}$

## Answer: A

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6. Objective question (single correct answer).
i. $\mathrm{H}_{3} \mathrm{PO}_{4}$ is a tribasic acid and one of its salt is $\mathrm{NaH}_{2} \mathrm{PO}_{4}$. What volume of 1 MNaOH solution should be added to $12 g$ of $\mathrm{NaH}_{2} \mathrm{PO}_{4}$ to convert in into $\mathrm{Na}_{3} \mathrm{PO}_{4}$ ?
ii. The normality of a mixture obtained mixing 100 mL of $0.2 \mathrm{mH}_{2} \mathrm{SO}_{4}$
with 100 mL of 0.2 MNaOH is:
a. 0.05 N b. 0.1 N c. 0.15 N d. 0.2 N
iii. 100 mL solution of 0.1 NHCl was titrated with 0.2 N NaOH solutions. The titration was discontinued after adding 30 mL of NaOH solution. The reamining titration was completed by adding 0.25 NKOH solution. The volume of KOH required from completing the titration is:
a. $70 m L$ b. $35 m L$ c. $32 m L$ d. $16 m L$
A. 100 cc
B. 300 cc
C. 200 cc
D. 80 cc

## Answer: C

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7. Equivalent mass of a bivalent metal is 32.7 g . Molecular mass of its chloride will be :
A. 68.2
B. 103.7
C. 136.4
D. 166.3

## Answer: C

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8. How much water is to be added to dilute 10 mL of 10 NHCl to make it decinormal?
A. 990 ml
B. 1010 ml
C. 100 ml
D. 1000 ml

## Answer: A

9. 0.45 g of an acid of mol. Mass 90 was neutralised by 20 mL of 0.54 N caustic potash $(\mathrm{KOH})$. The basicity of acid is :
A. 1
B. 2
C. 3
D. 4

## Answer: B

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10. In the reaction,
$I_{2}+2 S_{2} O_{3}^{2-} \rightarrow 2 I^{-}+S_{4} O_{6}^{2-}$.
Equivalent wieght of iodine will be equal to
A. Its molecular mass
B. $\frac{1}{2}$ of its molecular mass
C. $\frac{1}{4}$ of its molecular mass
D. Twice its molecular mass

## Answer: B

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11. The composition of a sample of Wustite is $F e_{0.93} O_{1.00}$. What percentage of the iron is present in the form of $F e(I I I)$ ?
A. $15.05 \%$
B. $10 \%$
C. $48.4 \%$
D. $16.66 \%$
12. Sample of haemoglobin is found to contain $0.333 \%$ of iron. Assuming that each molecule of haemoglobin contains four iron atoms, which of these is the correct molecular mass of haemoglobin ?
A. $67267 \mathrm{~g} / \mathrm{mole}$
B. $76543 \mathrm{~g} / \mathrm{mole}$
C. $11218 \mathrm{~g} / \mathrm{mole}$
D. $30033 \mathrm{~g} / \mathrm{mole}$

## Answer: A

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13. Atoms of elements $A, B$ and $C$ combine to form a compound in the atomic ratio of $1: 6: 2$. Atomic masses of $A, B$ and $C$ are 64,4 and 16
respectively. What will be the maximum mass of a compound formed from 1.28 g of $\mathrm{A}, 3 \times 10^{23}$ atoms of $B$ and 0.04 moles of $C$ ?
A. 12 g
B. 24 g
C. 2.4 g
D. 0.12 g

## Answer: C

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14. Ratio of the amounts of $H_{2} S$ needed to precipitate all the metal ions from 100 ml of $1 \mathrm{MAgNO}_{3}$ and 100 ml of $1 \mathrm{M} \mathrm{CuSO}_{4}$ will be :
A. 1:1
B. 1: 2
C. 2:1
D. 3:4

## Answer: B

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15. 2.5 g of the carbonate of a metal was treated with 100 ml of $1 \mathrm{NH}_{2} \mathrm{SO}_{4}$
. After the completion of the reaction, the solution was boiled off to expel $\mathrm{CO}_{2}$ and was then titrated against 1 N NaOH solution. The volume of alkali that would be consumed, if the equivalent weight of the metal is 20 .
A. 50 ml
B. 25 ml
C. 75 ml
D. 100 ml

## Answer: A

16. A metallic chloride contained $47.23 \%$ of metal ' M '. 1.0 g of this metal displaced from a compound 0.88 g of another metal X . What will be the equivalent mass of metal $M$ ?
A. 11.78 g
B. 27.96 g
C. 31.77 g
D. 23.42 g

## Answer: C

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17. 3.7 g of a gas at $25^{\circ} \mathrm{C}$ occupies the same volume as 0.184 g of hydrogen at $17^{\circ} \mathrm{C}$ and at the same pressure. What is the molecular mass of the gas ?
A. 41.3 g
B. 23.8 g
C. 37.8 g
D. 49.1 g

## Answer: A

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18. 1.0 g of an alloy of Al and Mg when treated with excess of dil HCl gave $\mathrm{MgCl}_{2}, \mathrm{AlCl}_{3}$ and hydrogen. Evolved hydrogen collected over Hg at $0^{\circ} \mathrm{C}$ has a volume of 1.20 litres at 0.92 atm pressure. The percentage of Aluminium in the alloy is:
A. $15 \%$
B. $55 \%$
C. $46 \%$
D. $25 \%$

## Answer: C

19. mixture of KBr and NaBr weighing 0.563 g was treated with aqueous $\mathrm{AgNO}_{3}$ and all the bromide ion was recovered as 0.975 g of pure AgBr . What fraction of total mass is KBr in the sample ?
A. 0.61
B. 0.22
C. 0.83
D. 0.45

## Answer: A

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## Illustration The Concept

1. One litre of sample of hard water contains 0.8 mg of $\mathrm{CaCl}_{2}$ and 0.8 mg of $\mathrm{MgCl}_{2}$. Find the total hardness in terms of parts of $\mathrm{CaCO}_{3}$, per $10^{6}$ parts of water by mass.

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## Practice Exercise 1

1. Classify the following substances as either being a homogenous or heterogenous mixture?
(1) Sugar + Water
(2) Sand + Water
(3) mixture of different pulses
(4) Air in the atmospheric column
(5) Soda
(6) Alloys
2. Classify the following substances as either being an element or a compound?
A. $O_{3}$
B. $S_{8}$
C. $\mathrm{CCl}_{4}$
D. $\mathrm{NO}_{2}$

## Answer:

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3. Are these mixtures or pure substances?
A. $F e S$
B. Graphite
C. Uranium
D. Saline solution

## Answer:

## D Watch Video Solution

## Practice Exercise 2

1. If the mass of an atom of $C-12$ becomes half of its actual value then the atomic mass of phosphorous will change from 31 amu to what new value?

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2. The atomic weight of $C u$ is 63.546 . There are only two naturally occurring isotopes of copper.${ }^{63} \mathrm{Cu}$ and ${ }^{65} \mathrm{Cu}$. The natural abundance of the. ${ }^{63} \mathrm{Cu}$ isotope must be approximately.

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1. How many oxygen atoms are there in $2.5 g$ - molecules of $\mathrm{K}_{2} \mathrm{SO}_{4} \cdot \mathrm{Al}_{2}\left(\mathrm{SO}_{4}\right)_{3} \cdot 12 \mathrm{H}_{2} \mathrm{O}$ ?

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2. 3.6 $\times 10^{22} \mathrm{NH}_{3}$ molecules contain how many moles of hydrogen?

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Practice Exercise 4

1. How many litres of $\mathrm{CO}_{2}$ gas at STP will react with 2.5 moles of KOH exactly to form $\mathrm{K}_{2} \mathrm{CO}_{3}$ ?

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2. What volume of $N_{2}$ gas will react with 11.2 litres of hydrogen to form ammonia at STP?

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## Practice Exercise 5

1. If a compound has $53.33 \%$ carbon, $31.11 \%$ nitrogen and the rest hydrogen then its empirical formula will be?

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2. A compound has molecular mass 220 amu. If it has $54.54 \%$ carbon, $36.36 \%$ oxygen and the rest hydrogen then its molecular formula will be
3. If 5.6 litres of hydrogen and 22.4 litres of oxygen react in a vessel to form water then the mass of water formed will be?

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2. What mass of $C O$ will be formed when 9 gm anhydrous oxalic acid is dehydrated with conc $\mathrm{H}_{2} \mathrm{SO}_{4}$ ?

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## Practice Exercise 7

1. What is the n-factor for $\mathrm{H}_{3} \mathrm{PO}_{4}$ in the reaction $2 \mathrm{NaOH}+\mathrm{H}_{3} \mathrm{PO}_{4} \rightarrow \mathrm{Na}_{2} \mathrm{HPO}_{4}+2 \mathrm{H}_{2} \mathrm{O}$ ?
2. What is the n -factor for $\mathrm{HNO}_{2}$ in the reaction $3 \mathrm{HNO}_{2} \rightarrow \mathrm{HNO}_{3}+2 \mathrm{NO}+\mathrm{H}_{2} \mathrm{O}$ ?

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## Practice Exercise 8

1. What molarity of $30 \mathrm{ml} \mathrm{Na}_{2} \mathrm{~S}_{2} \mathrm{O}_{3}$ will be needed to completely neutralise 12.7 g of iodine?

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## Practice Exercise 9

1. What will be the strength of $50 \mathrm{ml} \mathrm{K}_{2} \mathrm{Cr}_{2} \mathrm{O}_{7}$ that completely reacts with 11.2 litre of $\mathrm{H}_{2} \mathrm{~S}$ oxidizing it into sulphur?

## Practice Exercise 10

1. 0.012 g of $\mathrm{Ca}\left(\mathrm{HCO}_{3}\right)_{2}$ is present in 500 ml of water. Presuming density of water to be $1 \mathrm{~g} / \mathrm{cc}$, what is the hardness in ppm in terms of $\mathrm{CaCO}_{3}$ ?

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2. 20 ml of $0.5 \mathrm{M} \mathrm{KMnO}_{4}$ in acidic media exactly neutralises 30 ml of a $\mathrm{H}_{2} \mathrm{O}_{2}$ solution. The volume strength of $\mathrm{H}_{2} \mathrm{O}_{2}$ solution will be?

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## In Chapter Exercise A

1. What mass of H 2 SO 4 must be employed in the reaction $\mathrm{BaCl}_{2}+\mathrm{H}_{2} \mathrm{SO}_{4} \rightarrow \mathrm{BaSO}_{4}+2 \mathrm{HCl}$ if $22.08 \mathrm{gBaCl} l_{2}$ is used up and $2.33 \mathrm{gBaSO} 4,0.73 \mathrm{gHCl}$ are formed.
A. 0.98 g
B. 1.23 g
C. 0.72 g
D. 0.49 g

## Answer: A

## ( Watch Video Solution

2. In accordance with law of definite proportions, 2.16 g of Ag must combine with how much amount of carbon to form silver carbide $\left(A g_{2} C_{2}\right) ?$
A. 12 g
B. 0.24 g
C. 0.12 g
D. 2.4 g

## Answer: B

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3. Carbon combines with oxygen to form three oxides $\mathrm{CO}_{2}, \mathrm{CO}$ and $\mathrm{C}_{3} \mathrm{O}_{2}$. Among which pair of oxides does law of multiple proportions not hold true?
A. $\mathrm{CO}_{2}$ and CO
B. $C O$ and $\mathrm{C}_{3} \mathrm{O}_{2}$
C. $\mathrm{CO}_{2}$ and $\mathrm{C}_{3} \mathrm{O}_{2}$
D. It holds true in all cases

## Answer: B

4. If carbon combines with hydrogen to form methane and carbon also combines with oxygen to form carbon dioxide then as per law of reciprocal proportions the ratio of hydrogen and oxygen by mass that combines should be?
A. 8:1
B. 2: 1
C. 1:8
D. 1:2

## Answer: C

## - Watch Video Solution

5. State the law of definite proportion.
A. The discovery of multiple compounds formed between the same
B. The discovery of non-stoichiometric compounds
C. The discovery of networked solids
D. The discovery of salt-like carbides

## Answer: B

## - Watch Video Solution

6. What mass of sodium chloride would be decomposed by 9.8 g of sulphuric acid if 12 g of sodium bisulphate and 2.75 g of hydrogen chloride were produced in a reaction?
A. 5.6 g
B. 7.8 g
C. 3.1 g
D. 4.95 g

## Answer: D

7. Which of these is a necessary condition for law of definite proportions to hold true?
A. The compound under observation must not sublime
B. The compound under observation must be pure
C. The compound should not crack on heating
D. The compound should not be radioactive

## Answer: B

## - Watch Video Solution

8. Which of these is not a fruit?
A. When petrol is combusted in a vessel, finally the vessel is empty
B. When a piece of camphor is left standing in a dish, after a long time the dish is empty
C. When a bottle of chloroform is left open, after a short time the bottle has nothing in it.
D. None of the above choices is a violation of the law.

## Answer: D

## - Watch Video Solution

9. Which of these statements is incorrect regarding the laws of chemical combinations?
A. Combination of elements in ratio by atoms is same as their combination ratio by mass
B. Elements may not combine with each other also. For instance, sodium and potassium don't combine to form compounds.
C. Elements can have multiple valencies
D. Fixed amount of an element should combine with different amounts of another element for law of multiple proportions.

## Answer: A

## - Watch Video Solution

## In Chapter Exercise B

1. If 1 L of $O_{2}$ at $15^{\circ} \mathrm{C}$ and 750 mm pressure contains $N$ molecules, the number of molecules in 2 litre of $\mathrm{SO}_{2}$ under the same conditions of temperature and pressure will be
A. $N / 2$
B. N
C. 2 N
D. 4 N

## Answer: C

## - Watch Video Solution

2.4.4gmofCO ${ }_{2}$ and 2.24 litreof $\mathrm{H}_{2}$ at STP are mixed in a container. The total number of molecules present in the container will be:
A. $6.023 \times 10^{23}$
B. $1.2046 \times 10^{23}$
C. $6.023 \times 10^{22}$
D. $6.023 \times 10^{24}$

## Answer: B

## - Watch Video Solution

3. Myoglobin stores oxygen for metabolic processes in muscle. Chemical analysis shows that it contains $0.34 \%$ Fe by mass. Minimum molecular
mass of myoglobin is
A. 16470 gm
B. 16176 gm
C. 17500 gm
D. 1647 gm

## Answer: A

## - Watch Video Solution

4. An element , $X$ has the following isotopic composition : ^ $(200) X: 90 \%,{ }^{199} X: 8.0 \%,{ }^{202} X: 2.0 \%$ The weighted average atomic mass of the naturally occurring element X is closest to naturally occurring element X is closest to
A. 201 amu
B. 202 amu
C. 199 amu
D. 200 amu

## Answer: D

## D Watch Video Solution

5. The atomic weights of two alements $A$ and $B$ are 40 and 80 reapectively.

If $x g$ of $A$ contains $y$ atoms, how many atoms are present in $2 x g$ of $B$ ?
A. $\frac{y}{2}$
B. $\frac{y}{4}$
C. y
D. 2 y

## Answer: C

## - Watch Video Solution

6. A sample of $A I F_{3}$ contains $3.0 \times 10^{24} F^{-}$ions. The number of formula units of the sample are
A. $9 \times 10^{24}$
B. $3 \times 10^{24}$
C. $0.75 \times 10^{24}$
D. $1.0 \times 10^{24}$

## Answer: D

## - Watch Video Solution

7. Number of atoms in 558.5 gram Fe (At. wt. of $F e=55.85 \mathrm{gmol}^{-1}$ ) is
A. Twice that in 60 g of carbon
B. $6.022 \times 10^{22}$ atoms
C. Half than those in 8 g Helium
D. $558.5 \times 6.022 \times 10^{22}$ atoms

## D Watch Video Solution

8. What is the total number of atoms present in 25.0 mg of camphor, $C_{10} H_{16} O ?$
A. $9.89 \times 10^{19}$
B. $9.89 \times 10^{20}$
C. $6.02 \times 10^{20}$
D. $2.67 \times 10^{21}$

## Answer: D

## - Watch Video Solution

9. Which has the highest number of oxygen atoms?
$1 g O_{2}$ or $1 g O_{3}$ or $1 g O$
A. $1 g O_{2}$
B. $1 g O_{3}$
C. $1 g O$
D. All have same atoms

## Answer: D

## - Watch Video Solution

## In Chapter Exercise C

1. The density of a gaseous element is 5 times that of oxygen under similar conditions. If the molecule is triatomic, what will be its atomic mass?
A. 32
B. 160
C. 53.3

## Answer: C

## - Watch Video Solution

2. A gaseous nitrogen oxide contains $30.4 \%$ of nitrogen, one molecule of which contains one nitrogen atom. The density of the oxide relative to oxygen gas is :
A. 0.94
B. 1.44
C. 1.5
D. 2.75

## Answer: B

## - Watch Video Solution

3. Ten millilitre of a gaseous hydrocarbon was burnt completely in 80 ml of $O_{2}$ at STP. The volume of the remaining gas is 70 ml . The volume became 50 ml , on treatment with NaOH . The formula of the hydrocarbon is:
A. $C_{3} H_{6}$
B. $C_{2} H_{4}$
C. $\mathrm{CH}_{4}$
D. $C_{6} H_{6}$

## Answer: B

## - Watch Video Solution

4. Two elements A (Atomic Mass $12 \mathrm{~g} / \mathrm{mole}$ ) and B (Atomic Mass 16 $\mathrm{g} /$ mole) combine to yield a compound. The percentage mass of A in the compound is $27.3 \%$. The formula of the compound will be :
A. $A_{2} B_{2}$
B. $A B$
C. $A_{2} B$
D. $A B_{2}$

## Answer: D

## - Watch Video Solution

5. The carbonate of a metal is isomorphous with $\mathrm{MgCO}_{3}$ and contains 10.34 percent of carbon. Atomic mass of metal will be:
A. 56
B. 98
C. 40
D. 23

## Answer: A

6. A gaseous alkane is exploded with $\mathrm{O}_{2} 2$.

The volume of $O_{2}$ required for complete combustion and the volume of $\mathrm{CO}_{2}$ formed after combustion is 7:4 calculate the molecular formula of the alkane.
A. $C_{2} H_{6}$
B. $C_{3} H_{4}$
C. $C_{6} H_{6}$
D. $\mathrm{CH}_{4}$

## Answer: A

## - Watch Video Solution

7. A polystryrene, having formula $\mathrm{Br}_{3} \mathrm{C}_{6} \mathrm{H}_{2}\left(\mathrm{C}_{8} H_{8}\right)_{n}$, was perpared heating styrene with tribromobenzoyl peroxide in the absence of air. If it was found to contain $10.46 \%$ bromine by weight, find the value of $n$.
A. 19
B. 20
C. 15
D. 10

## Answer: A

## - Watch Video Solution

8. The simplest formula of a compound containing $50 \%$ of an element $X$ (atomic weight 10) and $50 \%$ of element $Y$ (atomic weight 20) is:
A. $X Y_{2}$
B. $X_{2} Y$
C. $X_{2} Y_{3}$
D. $X Y_{3}$

## Answer: B

9. How many molecules of water are present as water of crystallisation in Borax $\mathrm{Na}_{2} \mathrm{~B}_{4} \mathrm{O}_{7} . n \mathrm{H}_{2} \mathrm{O}$ if it loses $47.117 \%$ of mass on heating till it becomes anhydrous?
A. 10
B. 8
C. 6
D. 4

## Answer: A

## Watch Video Solution

10. The volume in litres of $\mathrm{CO}_{2}$ liberated at STP when 10 grams of $90 \%$ pure limestone is heated cmpletely is
A. 22.4 litres
B. 2.24 litres
C. 20.16 litres
D. 2.016 litres

## Answer: D

## - Watch Video Solution

11. In the reaction $4 A+2 B+3 C \rightarrow A_{4} B_{2} C_{3}$, the number of moles of product formed will be $\qquad$ if starting from 2 moles of $A, 1.2$ moles of B and 1.44 moles of C
A. 32
B. 160
C. 53.3
D. 80

## Answer: C

## - Watch Video Solution

12. The mass of sodium hydroxide produced when 175.5 g of NaCl reacts with excess of $\mathrm{Ca}(\mathrm{OH})_{2}$ is 102 g . The percentage yield is:
A. 0.94
B. 1.44
C. 1.5
D. 2.75

## Answer: B

## - Watch Video Solution

13.30 g Mg and $30 \mathrm{~g} \mathrm{O}_{2}$ are reacted and the residual mixture contains:
A. $C_{3} H_{6}$
B. $C_{2} H_{4}$
C. $\mathrm{CH}_{4}$
D. $C_{6} H_{6}$

## Answer: B

## - Watch Video Solution

14. Calculate the mass of lime $(\mathrm{CaO})$ obtained by heating 200 kg of $95 \%$ pure lime stone $\left(\mathrm{CaCo}_{3}\right)$ :
A. $A_{2} B_{2}$
B. $A B$
C. $A_{2} B$
D. $A B_{2}$
15. A silver coin weighing 11.34 g was dissolved in nitric acid When sodium chloride was added to the solution all the silver (present as $\mathrm{AgNO}_{3}$ ) precipitated as silver chloride. The mass of the precipitated silver chloride was 14.35 g . Calculate the percentage of silver in the coin.
A. $C_{2} H_{6}$
B. $C_{3} H_{4}$
C. $C_{6} H_{6}$
D. $\mathrm{CH}_{4}$

## Answer: A

## - Watch Video Solution

16. Consider the following reaction sequence:
$S_{8}(s)+8 O_{2}(g) \rightarrow 8 \mathrm{SO}_{2}(g)$
$2 \mathrm{SO}_{2}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow 2 \mathrm{SO}_{3}(\mathrm{~g})$
How many grams of $\mathrm{SO}_{3}$ are produced from 1 mole S?
A. 19
B. 20
C. 15
D. 10

## Answer: A

## - Watch Video Solution

17. $4 \mathrm{Fe}+3 \mathrm{O}_{2} \rightarrow 2 \mathrm{Fe}_{2} \mathrm{O}_{3}$ (reference to iron)
A. $X Y_{2}$
B. $X_{2} Y$
C. $X_{2} Y_{3}$
D. $X Y_{3}$

## - Watch Video Solution

18. 30 ml of a mixture of oxygen $\left(\mathrm{O}_{2}\right)$ and ozone $\left(\mathrm{O}_{3}\right)$ was heated till ozone was completely decomposed. The mixture on cooling was found to expand 40 ml . The volume of $O_{2}$ in original mixture was :
A. 10
B. 8
C. 6
D. 4

## Answer: A

19. Polythene can be produced from calcium carbide according to the following sequence of reactions.

$$
\mathrm{CaC}_{2}+2 \mathrm{H}_{2} \mathrm{O} \rightarrow \mathrm{Ca}(\mathrm{OH})_{2}+\mathrm{C}_{2} \mathrm{H}_{2}, \mathrm{C}_{2} \mathrm{H}_{2}+\mathrm{H}_{2} \rightarrow \mathrm{C}_{2} \mathrm{H}_{4}, n \mathrm{C}_{2} \mathrm{H}_{4} \rightarrow\left(\mathrm{C}_{2}\right.
$$

The mass of polythene which can be produced from 20.0 kg of $C a C_{2}$ is :
A. 22.4 litres
B. 2.24 litres
C. 20.16 litres
D. 2.016 litres

## Answer: D

## - Watch Video Solution

20. The density of liquid ethanol is $0.7892 \mathrm{~g} / \mathrm{ml}$ at $20^{\circ} \mathrm{C}$. If 1.2 mol of ethanol are needed for a particular experimental, what volume of ethanol should be measured out?
A. 32
B. 160
C. 53.3
D. 80

## Answer: C

## - Watch Video Solution

21. 200 ml of an aqueous solution of glucose $\left(\mathrm{C}_{6} \mathrm{H}_{12} \mathrm{O}_{6}\right)$ has molarity of 0.01 M . Which of the following operations can be done to this solution so as to increase molarity to 0.015 M ?
A. 0.94
B. 1.44
C. 1.5
D. 2.75

## D Watch Video Solution

22. The normality of HCl solution with a density of $1.19 \mathrm{gm} / \mathrm{ml}$ containing $37 \% \mathrm{HCl}$ by mass is:
A. $C_{3} H_{6}$
B. $\mathrm{C}_{2} \mathrm{H}_{4}$
C. $\mathrm{CH}_{4}$
D. $C_{6} H_{6}$

## Answer: B

## - Watch Video Solution

23. 10 L of hard water required 5.6 g of lime for removing hardness. Hence temperorary hardness in ppm of $\mathrm{CaCO}_{3}$ is:
A. $A_{2} B_{2}$
B. $A B$
C. $A_{2} B$
D. $A B_{2}$

## Answer: D

## - Watch Video Solution

24. Permanent hardness is due to $\mathrm{CI}^{\ominus}$ and $\mathrm{SO}_{4}^{2-}$ of $\mathrm{Mg}^{2+}$ and $\mathrm{Ca}^{2+}$ and is removed by adding $\mathrm{Na}_{2} \mathrm{CO}_{3}$.
$\mathrm{CaSO}_{4}+\mathrm{Na}_{2} \mathrm{CO}_{3} \rightarrow \mathrm{CaCO}_{3}+\mathrm{Na}_{2} \mathrm{SO}_{4}$ $\mathrm{CaCl}_{2}+\mathrm{Na}_{2} \mathrm{CO}_{3} \rightarrow \mathrm{CaCO}_{3}+2 \mathrm{NaCl}$

Which of the following statements is / are correct?
A. 56
B. 98
C. 40
D. 23

## D Watch Video Solution

25. Equal moles of water and user are taken in a flask. What is mass percentage of urea in the solution ?
A. $C_{2} H_{6}$
B. $C_{3} H_{4}$
C. $C_{6} H_{6}$
D. $\mathrm{CH}_{4}$

## Answer: A

## - Watch Video Solution

26. Hardness of water is 200 ppm . The normality and molarity of $\mathrm{CaCO}_{3}$ in the water is
(a). $2 \times 10^{-6}\left(N, 2 \times 10^{-6} M\right.$
(b). $4 \times 10^{-2} N, 2 \times 10^{-2} M$
(c). $4 \times 10^{-3} N, 2 \times 10^{-3} M$
(d). $4 \times 10^{-1} N, 2 \times 10^{-1} M$
A. 19
B. 20
C. 15
D. 10

## Answer: A

## - Watch Video Solution

27. 50 ml of water sample requires 10 ml of $\frac{M}{50} \mathrm{HCl}$ for complete neutralization. Calculate hardness of $\mathrm{H}_{2} \mathrm{O}$ (temporary) in ppm.
A. 2 ppm
B. 20 ppm
C. 200ppm
D. 324 ppm

## Answer: B

## - Watch Video Solution

28. The density of the solution of a salt $X$ is $1.15 \mathrm{~g} \mathrm{~mL}^{-1} .20 \mathrm{~mL}$ of the solution when completely evaporated gave a residue of 4.6 g of the salt. Calculate the mass percentage of the solute in solution.
A. 10
B. 8
C. 6
D. 4

## Answer: A

## In Chapter Exercise D

1. The density of a gaseous element is 5 times that of oxygen under similar conditions. If the molecule is triatomic, what will be its atomic mass?
A. 0.25
B. 0.3
C. 0.24
D. 2.32

## Answer: C

## - Watch Video Solution

2. A gaseous nitrogen oxide contains $30.4 \%$ of nitrogen, one molecule of which contains one nitrogen atom. The density of the oxide relative to
oxygen gas is:
A. 58.12
B. 85
C. 42.5
D. 33.3

## Answer: B

## - Watch Video Solution

3. Ten millilitre of a gaseous hydrocarbon was burnt completely in 80 ml of $O_{2}$ at STP. The volume of the remaining gas is 70 ml . The volume became 50 ml , on treatment with NaOH . The formula of the hydrocarbon is:
A. 90 g of magnesium oxide only
B. 75 g of magnesium oxide and 15 g of magnesium
C. 50 g of magnesium oxide and 10 g of oxygen
D. 75 g of magnesium oxide and 15 g of oxygen

## Answer: B

## - Watch Video Solution

4. Two elements A (Atomic Mass $12 \mathrm{~g} / \mathrm{mole}$ ) and B (Atomic Mass 16 $\mathrm{g} /$ mole) combine to yield a compound. The percentage mass of A in the compound is $27.3 \%$. The formula of the compound will be :
A. 11.2 kg
B. 32.14 kg
C. 36 kg
D. 56 kg

## Answer: B

## - Watch Video Solution

5. The carbonate of a metal is isomorphous with $\mathrm{MgCO}_{3}$ and contains 10.34 percent of carbon. Atomic mass of metal will be:
A. 980 mg
B. 400 mg
C. 1.75 g
D. 0.74 g

## Answer: D

## (D) Watch Video Solution

6. A gaseous alkane is exploded with $\mathrm{O}_{-} 2$.

The volume of $O_{2}$ required for complete combustion and the volume of $\mathrm{CO}_{2}$ formed after combustion is 7:4 calculate the molecular formula of the alkane.
A. $4.8 \%$
B. $95.2 \%$
C. $90 \%$
D. $80 \%$

## Answer: B

## - Watch Video Solution

7. A polystryrene, having formula $\mathrm{Br}_{3} \mathrm{C}_{6} \mathrm{H}_{2}\left(\mathrm{C}_{8} H_{8}\right)_{n}$, was perpared heating styrene with tribromobenzoyl peroxide in the absence of air. If it was found to contain $10.46 \%$ bromine by weight, find the value of $n$.
A. 1280
B. 640
C. 960
D. 320

## Answer: B

8. The simplest formula of a compound containing $50 \%$ of an element $X$ (atomic weight 10 ) and $50 \%$ of element $Y$ (atomic weight 20 ) is:
A. 27 gm
B. 2.7 gm
C. 13.5 gm
D. 54 gm

## Answer: C

## - Watch Video Solution

9. How many molecules of water are present as water of crystallisation in Borax $\mathrm{Na}_{2} \mathrm{~B}_{4} \mathrm{O}_{7} . n \mathrm{H}_{2} \mathrm{O}$ if it loses $47.117 \%$ of mass on heating till it becomes anhydrous?
A. 20 ml
B. 10 ml
C. 25 ml
D. 15 ml

## Answer: B

## - Watch Video Solution

10. The volume in litres of $\mathrm{CO}_{2}$ liberated at STP when 10 grams of $90 \%$ pure limestone is heated cmpletely is
A. 8.75 kg
B. 20 kg
C. 16.5 kg
D. 9.65 kg

## Answer: A

11. In the reaction $4 A+2 B+3 C \rightarrow A_{4} B_{2} C_{3}$, the number of moles of product formed will be $\qquad$ if starting from 2 moles of $\mathrm{A}, 1.2$ moles of B and 1.44 moles of C
A. 0.25
B. 0.3
C. 0.24
D. 2.32

## Answer: C

## - Watch Video Solution

12. The mass of sodium hydroxide produced when 175.5 g of NaCl reacts with excess of $\mathrm{Ca}(\mathrm{OH})_{2}$ is 102 g . The percentage yield is :
A. 58.12
B. 85
C. 42.5
D. 33.3

## Answer: B

## D Watch Video Solution

13. 30 g Mg and $30 \mathrm{~g} O_{2}$ are reacted and the residual mixture contains:
A. 90 g of magnesium oxide only
B. 75 g of magnesium oxide and 15 g of magnesium
C. 50 g of magnesium oxide and 10 g of oxygen
D. 75 g of magnesium oxide and 15 g of oxygen

## Answer: B

14. Calculate the mass of lime ( CaO ) obtained by heating 200 kg of $95 \%$ pure lime stone $\left(\mathrm{CaCo}_{3}\right)$ :
A. 11.2 kg
B. 32.14 kg
C. 36 kg
D. 56 kg

## Answer: B

## - Watch Video Solution

15. A silver coin weighing 11.34 g was dissolved in nitric acid When sodium chloride was added to the solution all the silver (present as $\mathrm{AgNO}_{3}$ ) precipitated as silver chloride. The mass of the precipitated silver chloride was 14.35 g . Calculate the percentage of silver in the coin.
A. $4.8 \%$
B. $95.2 \%$
C. $90 \%$
D. $80 \%$

## Answer: B

## - Watch Video Solution

16. Consider the following reaction sequence:
$S_{8}(s)+8 O_{2}(g) \rightarrow 8 \mathrm{SO}_{2}(g)$
$2 \mathrm{SO}_{2}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow 2 \mathrm{SO}_{3}(\mathrm{~g})$
How many grams of $\mathrm{SO}_{3}$ are produced from 1 mole S?
A. 1280
B. 640
C. 960
D. 320

## - Watch Video Solution

17. $4 \mathrm{Fe}+3 \mathrm{O}_{2} \rightarrow 2 \mathrm{Fe}_{2} \mathrm{O}_{3}$ (reference to iron)
A. 27 gm
B. 2.7 gm
C. 13.5 gm
D. 54 gm

## Answer: C

## - Watch Video Solution

18. 30 ml of a mixture of oxygen $\left(O_{2}\right)$ and ozone $\left(O_{3}\right)$ was heated till ozone was completely decomposed. The mixture on cooling was found to expand 40 ml . The volume of $O_{2}$ in original mixture was :
A. 20 ml
B. 10 ml
C. 25 ml
D. 15 ml

## Answer: B

## - Watch Video Solution

19. Polythene can be produced from calcium carbide according to the following sequence of reactions.
$\mathrm{CaC}_{2}+2 \mathrm{H}_{2} \mathrm{O} \rightarrow \mathrm{Ca}(\mathrm{OH})_{2}+\mathrm{C}_{2} \mathrm{H}_{2}, \mathrm{C}_{2} \mathrm{H}_{2}+\mathrm{H}_{2} \rightarrow \mathrm{C}_{2} \mathrm{H}_{4}, n \mathrm{C}_{2} \mathrm{H}_{4} \rightarrow\left(\mathrm{C}_{2}\right.$
The mass of polythene which can be produced from 20.0 kg of $C a C_{2}$ is :
A. 8.75 kg
B. 20 kg
C. 16.5 kg
D. 9.65 kg

## - Watch Video Solution

20. The density of liquid ethanol is $0.7892 \mathrm{~g} / \mathrm{ml}$ at $20^{\circ} \mathrm{C}$. If 1.2 mol of ethanol are needed for a particular experimental, what volume of ethanol should be measured out?
A. 0.25
B. 0.3
C. 0.24
D. 2.32

## Answer: C

21. 200 ml of an aqueous solution of glucose $\left(\mathrm{C}_{6} \mathrm{H}_{12} \mathrm{O}_{6}\right)$ has molarity of 0.01 M . Which of the following operations can be done to this solution so as to increase molarity to 0.015 M ?
A. 58.12
B. 85
C. 42.5
D. 33.3

## Answer: B

## - Watch Video Solution

22. The normality of HCl solution with a density of $1.19 \mathrm{gm} / \mathrm{ml}$ containing $37 \% \mathrm{HCl}$ by mass is :
A. 90 g of magnesium oxide only
B. 75 g of magnesium oxide and 15 g of magnesium
C. 50 g of magnesium oxide and 10 g of oxygen
D. 75 g of magnesium oxide and 15 g of oxygen

## Answer: B

## - Watch Video Solution

23. 10L of hard water required 5.6 g of lime for removing hardness. Hence temperorary hardness in ppm of $\mathrm{CaCO}_{3}$ is:
A. 11.2 kg
B. 32.14 kg
C. 36 kg
D. 56 kg

## Answer: B

24. Permanent hardness is due to $\mathrm{CI}^{\ominus}$ and $\mathrm{SO}_{4}^{2-}$ of $\mathrm{Mg}^{2+}$ and $\mathrm{Ca}^{2+}$ and is removed by adding $\mathrm{Na}_{2} \mathrm{CO}_{3}$.

$$
\begin{aligned}
& \mathrm{CaSO}_{4}+\mathrm{Na}_{2} \mathrm{CO}_{3} \rightarrow \mathrm{CaCO}_{3}+\mathrm{Na}_{2} \mathrm{SO}_{4} \\
& \mathrm{CaCl}_{2}+\mathrm{Na}_{2} \mathrm{CO}_{3} \rightarrow \mathrm{CaCO}_{3}+2 \mathrm{NaCl}
\end{aligned} \text { Which of the following }
$$ statements is / are correct?

A. 980 mg
B. 400 mg
C. 1.75 g
D. 0.74 g

## Answer: D

## - Watch Video Solution

25. Equal moles of water and user are taken in a flask. What is mass percentage of urea in the solution ?
A. $4.8 \%$
B. $95.2 \%$
C. $90 \%$
D. $80 \%$

## Answer: B

## - Watch Video Solution

26. Hardness of water is 200 ppm . The normality and molarity of $\mathrm{CaCO}_{3}$ in the water is
(a). $2 \times 10^{-6}\left(N, 2 \times 10^{-6} M\right.$
(b). $4 \times 10^{-2} N, 2 \times 10^{-2} M$
(c). $4 \times 10^{-3} N, 2 \times 10^{-3} M$
(d). $4 \times 10^{-1} N, 2 \times 10^{-1} M$
A. 1280
B. 640
C. 960
D. 320

## Answer: B

## - Watch Video Solution

27. 50 ml of water sample requires 10 ml of $\frac{M}{50} \mathrm{HCl}$ for complete neutralization. Calculate hardness of $\mathrm{H}_{2} \mathrm{O}$ (temporary) in ppm.
A. 2 ppm
B. 20 ppm
C. 200ppm
D. 324 ppm

## Answer: C

## - Watch Video Solution

28. The density of the solution of a salt $X$ is $1.15 \mathrm{~g} \mathrm{~mL}^{-1} .20 \mathrm{~mL}$ of the solution when completely evaporated gave a residue of 4.6 g of the salt. Calculate the mass percentage of the solute in solution.
A. 20 ml
B. 10 ml
C. 25 ml
D. 15 ml

## Answer: B

## - Watch Video Solution

## In Chapter Exercise E

1. The density of a gaseous element is 5 times that of oxygen under similar conditions. If the molecule is triatomic, what will be its atomic mass ?
A. 55 mL
B. 58 mL
C. 70 mL
D. 79 mL

## Answer: C

## - Watch Video Solution

2. A gaseous nitrogen oxide contains $30.4 \%$ of nitrogen, one molecule of which contains one nitrogen atom. The density of the oxide relative to oxygen gas is :
A. evaporate 50 mL solution
B. add 0.180 g glucose
C. both (1) and (2) are correct
D. none of the above is correct

## Answer: B

## - Watch Video Solution

3. Ten millilitre of a gaseous hydrocarbon was burnt completely in 80 ml of $O_{2}$ at STP. The volume of the remaining gas is 70 ml . The volume became 50 ml , on treatment with NaOH . The formula of the hydrocarbon is:
A. 12.02 N
B. 6.03 N
C. 18.4 N
D. 11.9 N

## Answer: A

4. Two elements A (Atomic Mass $12 \mathrm{~g} / \mathrm{mole}$ ) and B (Atomic Mass 16 $\mathrm{g} /$ mole) combine to yield a compound. The percentage mass of A in the compound is $27.3 \%$. The formula of the compound will be :
A. 56
B. 0.5
C. 200
D. 162

## Answer: D

## - Watch Video Solution

5. The carbonate of a metal is isomorphous with $\mathrm{MgCO}_{3}$ and contains 10.34 percent of carbon. Atomic mass of metal will be:
A. 2.65 gm
B. 0.106 gm
C. 1.06 gm
D. 10.6 gm

## Answer: C

## - Watch Video Solution

6. A gaseous alkane is exploded with $\mathrm{O}_{2} 2$.

The volume of $O_{2}$ required for complete combustion and the volume of $\mathrm{CO}_{2}$ formed after combustion is 7:4 calculate the molecular formula of the alkane.
A. $25 \%$
B. $23.07 \%$
C. $77 \%$
D. $83 \%$

## Answer: C

7. A polystryrene, having formula $\mathrm{Br}_{3} \mathrm{C}_{6} H_{2}\left(\mathrm{C}_{8} H_{8}\right)_{n}$, was perpared heating styrene with tribromobenzoyl peroxide in the absence of air. If it was found to contain $10.46 \%$ bromine by weight, find the value of $n$.
A. 0.004 M
B. 0.002 M
C. 0.001 M
D. 0.0005 M

## Answer: B

## (D) Watch Video Solution

8. The simplest formula of a compound containing $50 \%$ of an element $X$ (atomic weight 10) and $50 \%$ of element $Y$ (atomic weight 20 ) is:
A. 2 ppm
B. 20 ppm
C. 200ppm
D. 324 ppm

## Answer: D

## - Watch Video Solution

9. How many molecules of water are present as water of crystallisation in Borax $\mathrm{Na}_{2} \mathrm{~B}_{4} \mathrm{O}_{7} \cdot n \mathrm{H}_{2} \mathrm{O}$ if it loses $47.117 \%$ of mass on heating till it becomes anhydrous?
A. $20 \%$
B. $26 \%$
C. $80 \%$
D. $40 \%$

## Answer: A

10. The volume in litres of $\mathrm{CO}_{2}$ liberated at STP when 10 grams of $90 \%$ pure limestone is heated cmpletely is
A. 7: 3
B. 3:7
C. 1:1
D. 2: 1

## Answer: A

## - Watch Video Solution

11. In the reaction $4 A+2 B+3 C \rightarrow A_{4} B_{2} C_{3}$, the number of moles of product formed will be____ if starting from 2 moles of $A, 1.2$ moles of $B$ and 1.44 moles of C
A. 55 mL
B. 58 mL
C. 70 mL
D. 79 mL

## Answer: C

## - Watch Video Solution

12. The mass of sodium hydroxide produced when 175.5 g of NaCl reacts with excess of $\mathrm{Ca}(\mathrm{OH})_{2}$ is 102 g . The percentage yield is :
A. evaporate 50 mL solution
B. add 0.180 g glucose
C. both (1) and (2) are correct
D. none of the above is correct
13.30 g Mg and $30 \mathrm{~g} \mathrm{O}_{2}$ are reacted and the residual mixture contains:
A. 12.02 N
B. 6.03 N
C. 18.4 N
D. 11.9 N

## Answer: A

## Watch Video Solution

14. Calculate the mass of lime $(\mathrm{CaO})$ obtained by heating 200 kg of $95 \%$ pure lime stone $\left(\mathrm{CaCo}_{3}\right)$ :
A. 56
B. 0.5
C. 200
D. 162

## Answer: D

## - Watch Video Solution

15. A silver coin weighing 11.34 g was dissolved in nitric acid When sodium chloride was added to the solution all the silver (present as $\mathrm{AgNO}_{3}$ ) precipitated as silver chloride. The mass of the precipitated silver chloride was 14.35 g . Calculate the percentage of silver in the coin.
A. $25 \%$
B. $23.07 \%$
C. $77 \%$
D. $83 \%$

## Answer: C

16. Consider the following reaction sequence:
$S_{8}(s)+8 O_{2}(g) \rightarrow 8 \mathrm{SO}_{2}(g)$
$2 \mathrm{SO}_{2}(\mathrm{~g})+\mathrm{O}_{2}(\mathrm{~g}) \rightarrow 2 \mathrm{SO}_{3}(\mathrm{~g})$
How many grams of $\mathrm{SO}_{3}$ are produced from 1 mole S?
A. 0.004 M
B. 0.002 M
C. 0.001 M
D. 0.0005 M

## Answer: B

## - Watch Video Solution

17. $4 \mathrm{Fe}+3 \mathrm{O}_{2} \rightarrow 2 \mathrm{Fe}_{2} \mathrm{O}_{3}$ (reference to iron)
B. 20 ppm
C. 200ppm
D. 324 ppm

## Answer: D

## - Watch Video Solution

18. 30 ml of a mixture of oxygen $\left(\mathrm{O}_{2}\right)$ and ozone $\left(\mathrm{O}_{3}\right)$ was heated till ozone was completely decomposed. The mixture on cooling was found to expand 40 ml . The volume of $O_{2}$ in original mixture was :
A. $20 \%$
B. $26 \%$
C. $80 \%$
D. $40 \%$

## Answer: A

19. Polythene can be produced from calcium carbide according to the following sequence of reactions.

$$
\mathrm{CaC}_{2}+2 \mathrm{H}_{2} \mathrm{O} \rightarrow \mathrm{Ca}(\mathrm{OH})_{2}+\mathrm{C}_{2} \mathrm{H}_{2}, \mathrm{C}_{2} \mathrm{H}_{2}+\mathrm{H}_{2} \rightarrow \mathrm{C}_{2} \mathrm{H}_{4}, n \mathrm{C}_{2} \mathrm{H}_{4} \rightarrow\left(\mathrm{C}_{2}\right.
$$

The mass of polythene which can be produced from 20.0 kg of $C a C_{2}$ is :
A. $7: 3$
B. 3:7
C. 1:1
D. 2:1

## Answer: A

## - Watch Video Solution

20. The density of liquid ethanol is $0.7892 \mathrm{~g} / \mathrm{ml}$ at $20^{\circ} \mathrm{C}$. If 1.2 mol of ethanol are needed for a particular experimental, what volume of ethanol

## should be measured out?

A. 55 mL
B. 58 mL
C. 70 mL
D. 79 mL

## Answer: C

## - Watch Video Solution

21. 200 ml of an aqueous solution of glucose $\left(\mathrm{C}_{6} \mathrm{H}_{12} \mathrm{O}_{6}\right)$ has molarity of 0.01 M . Which of the following operations can be done to this solution so as to increase molarity to 0.015 M ?
A. evaporate 50 mL solution
B. add 0.180 g glucose
C. both (1) and (2) are correct
D. none of the above is correct

## Answer: B

## - Watch Video Solution

22. The normality of HCl solution with a density of $1.19 \mathrm{gm} / \mathrm{ml}$ containing
$37 \% \mathrm{HCl}$ by mass is:
A. 12.02 N
B. 6.03 N
C. 18.4 N
D. 11.9 N

## Answer: A

23. 10 L of hard water required 5.6 g of lime for removing hardness. Hence temperorary hardness in ppm of $\mathrm{CaCO}_{3}$ is:
A. 56
B. 0.5
C. 200
D. 162

## Answer: D

## - Watch Video Solution

24. Permanent hardness is due to $C I^{\ominus}$ and $\mathrm{SO}_{4}^{2-}$ of $\mathrm{Mg}^{2+}$ and $\mathrm{Ca}^{2+}$ and is removed by adding $\mathrm{Na}_{2} \mathrm{CO}_{3}$.

$$
\mathrm{CaSO}_{4}+\mathrm{Na}_{2} \mathrm{CO}_{3} \rightarrow \mathrm{CaCO}_{3}+\mathrm{Na}_{2} \mathrm{SO}_{4}
$$

$$
\mathrm{CaCl}_{2}+\mathrm{Na}_{2} \mathrm{CO}_{3} \rightarrow \mathrm{CaCO}_{3}+2 \mathrm{NaCl}
$$

Which of the following statements is / are correct?
A. 2.65 gm
B. 0.106 gm
C. 1.06 gm
D. 10.6 gm

## Answer: C

## - Watch Video Solution

25. Equal moles of water and user are taken in a flask. What is mass percentage of urea in the solution?
A. $25 \%$
B. $23.07 \%$
C. $77 \%$
D. $83 \%$

## Answer: C

26. Hardness of water is 200 ppm . The normality and molarity of $\mathrm{CaCO}_{3}$ in the water is
(a). $2 \times 10^{-6}\left(N, 2 \times 10^{-6} M\right.$
(b). $4 \times 10^{-2} N, 2 \times 10^{-2} M$
(c). $4 \times 10^{-3} N, 2 \times 10^{-3} M$
(d). $4 \times 10^{-1} N, 2 \times 10^{-1} M$
A. 0.004 M
B. 0.002 M
C. 0.001 M
D. 0.0005 M

## Answer: B

## - Watch Video Solution

27. 50 ml of water sample requires 10 ml of $\frac{M}{50} \mathrm{HCl}$ for complete neutralization. Calculate hardness of $\mathrm{H}_{2} \mathrm{O}$ (temporary) in ppm.
A. 2 ppm
B. 20 ppm
C. 200ppm
D. 324 ppm

## Answer: D

## - Watch Video Solution

28. The density of the solution of a salt $X$ is $1.15 \mathrm{~g} \mathrm{~mL}^{-1} .20 \mathrm{~mL}$ of the solution when completely evaporated gave a residue of 4.6 g of the salt. Calculate the mass percentage of the solute in solution.
A. $20 \%$
B. $26 \%$
C. $80 \%$
D. $40 \%$

## Answer: A

## - Watch Video Solution

In Chapter Exercise F

1. Oxidation number of As in $\mathrm{H}_{2} \mathrm{AsO}_{4}^{-}$is
A. 6
B. 7
C. 5
D. 9

## Answer: C

2. The oxidation number of phosphorus in $\mathrm{Ba}\left(\mathrm{H}_{2} \mathrm{PO}_{2}\right)_{2}$ is:
A. +1
B. -1
C. +2
D. 3

## Answer: A

## - Watch Video Solution

3. A mole of $N_{2} H_{4}$ loses 10 mol of electrons to form a new compound Y . Assuming that all the nitrogen appears in the new compound, what is the oxidation state of nitrogen in $Y$ ? ( There is no change in the oxidation number of hydrogen. )
A. +3
B. -3
C. +1
D. +5

## Answer: A

## - Watch Video Solution

4. Among the following molecules, in which does bromine show the maximum oxidation state?
A. $\mathrm{Hg}_{2}\left(\mathrm{BrO}_{3}\right)_{2}$
B. $\mathrm{Br}-\mathrm{Cl}$
C. $\mathrm{KBrO}_{4}$
D. $B r_{2}$

## Answer: C

5. A metal ion $M^{3+}$ loses three electrons, its oxidation number will be
A. +3
B. +4
C. -3
D. +6

## Answer: D

## - Watch Video Solution

6. In the reaction
$3 \mathrm{Br}_{2}+6 \mathrm{CO}_{3}^{2-}+3 \mathrm{H}_{2} \mathrm{O} \rightarrow 5 \mathrm{Br}^{\ominus}+\mathrm{BrO}_{3}^{\ominus}+6 \mathrm{HCO}_{3}^{\ominus}$
A. bromine is oxidized and the carbonate radical is reduced
B. bromine is reduced and the carbonate radical is oxidized
C. bromine is neither reduced nor oxidized
D. bromine is both reduced and oxidized

## Answer: D

## - Watch Video Solution

7. In which of the following compounds the transition metal has an oxidation number of +2 ?
A. $\mathrm{Fe}_{2}\left(\mathrm{SO}_{4}\right)$
B. $S c_{2} O_{3}$
C. $V_{2} O_{5}$
D. $\mathrm{NiSO}_{4}$

## Answer: D

## - Watch Video Solution

8. Which of the following has been arranged in order of increasing oxidation number of nitrogen?
A. $\mathrm{NH}_{3}<\mathrm{N}_{2} \mathrm{O}_{5}<\mathrm{NO}<\mathrm{N}_{2}$
B. $\mathrm{NO}_{2}^{+}<\mathrm{NO}_{3}^{-}<\mathrm{NO}_{2}^{-}<\mathrm{N}_{3}^{-}$
C. $\mathrm{NH}_{4}^{+}<\mathrm{N}_{2} \mathrm{H}_{4}<\mathrm{NH}_{2} \mathrm{OH}<\mathrm{N}_{2} \mathrm{O}$
D. $\mathrm{NO}_{2}<\mathrm{NaN}_{3}<\mathrm{NH}_{4}^{+}<\mathrm{N}_{2} \mathrm{O}$

## Answer: C

## - Watch Video Solution

9. The oxidation number of carboxylic carbon atom in $\mathrm{CH}_{3} \mathrm{COOH}$ is
A. +2
B. +4
C. +1
D. +3

## - Watch Video Solution

10. The number of electrons involved in the reduction of nitrate $\left(\mathrm{NO}_{3}^{\ominus}\right)$ to hydrazine $\left(N_{2} H_{4}\right)$ is
A. 8
B. 7
C. 5
D. 3

## Answer: B

## - Watch Video Solution

In Chapter Exercise G

1. Equivalent weight of $N_{2}$ in the change
$\mathrm{N}_{2} \rightarrow \mathrm{NH}_{3}$ is
A. $28 / 6$
B. 28
C. $28 / 2$
D. $28 / 3$

## Answer: A

## - Watch Video Solution

2. The equivalent mass of a metal is twice to that of oxygen. How many times the weight of it's oxide is greater than the weight of metal?
A. 1.5 times
B. 2 times
C. 3 times
D. 4 times

## Answer: A

## - Watch Video Solution

3. Equivalent mass of $H_{3} P_{2}$ when it disproportionate into $\mathrm{PH}_{3}$ and $\mathrm{H}_{3} \mathrm{PO}_{3}$ is:
A. $\frac{M}{4}$
B. $\frac{3}{4} M$
C. $\frac{2}{3} M$
D. $\frac{M}{5}$

## Answer: C

## - Watch Video Solution

4. In the following reaction, $\mathrm{O}_{3}+6 \mathrm{I}^{-}+6 \mathrm{H}^{+} \rightarrow 3 \mathrm{I}_{2}+3 \mathrm{H}_{2} \mathrm{O}$ equivalent mass of $O_{3}$ (with molecular mass M ) is :
A. $\frac{M}{2}$
B. $\frac{M}{4}$
C. $\frac{M}{24}$
D. $\frac{M}{6}$

## Answer: D

## - Watch Video Solution

5.1 mol of $\mathrm{FeC}_{2} \mathrm{O}_{4}$ is oxidized by x mol of $\mathrm{Cr}_{2} \mathrm{O}_{7}^{2-}$ in acidic medium, x is
A. 3
B. 1.5
C. 0.5
D. 1.0

## Answer: C

## - Watch Video Solution

6.2 gm of a metal when dissolved in $\mathrm{HNO}_{3}$, gets converted into nitrate salt. The nitrate was then precipitated to form 2.66 gm of metal chloride. Equivalent mass of metal can be :
A. 28
B. 23.5
C. 9
D. 108

## Answer: D

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7. In the reaction $\mathrm{VO}+\mathrm{Fe}_{2} \mathrm{O}_{3} \rightarrow \mathrm{FeO}+\mathrm{V}_{2} \mathrm{O}_{5}$. What is the n-factor for $V_{2} O_{5} ?$
A. Mol Mass
B. $\frac{\mathrm{Mol} \text { Mass }}{4}$
C. $\frac{\text { Mol Mass }}{6}$
D. $\frac{\mathrm{Mol} \mathrm{Mass}}{8}$

## Answer: C

## - Watch Video Solution

8. When $\mathrm{BrO}_{3}^{-}$ion reacts with $\mathrm{Br}^{-}$iron in acid solution $\mathrm{Br}_{2}$ is liberated. The equivalent weight of KBrO in this reaction is:
A. $\frac{\text { Mol Mass }}{8}$
B. $\frac{\mathrm{Mol} \mathrm{Mass}}{3}$
C. $\frac{\mathrm{Mol} \text { Mass }}{5}$
D. $\frac{\text { Mol Mass }}{6}$

## Answer: C

## - Watch Video Solution

9. Calculate equivalent weight of $\mathrm{H}_{3} \mathrm{PO}_{4}$ and $\mathrm{Ca}(\mathrm{OH})_{2}$ on the basis of given reaction.
$\mathrm{H}_{3} \mathrm{PO}_{4}+\mathrm{NaOH} \rightarrow \mathrm{NaH}_{2} \mathrm{PO}_{4}+\mathrm{H}_{2} \mathrm{O}$
$\mathrm{Ca}(\mathrm{OH})_{2}+\mathrm{HCL} \rightarrow \mathrm{Ca}(\mathrm{OH}) \mathrm{CL}+\mathrm{H}_{2} \mathrm{O}$
A. 59
B. 49
C. 25
D. 98

## Answer: D

10. $\mathrm{FeS}+\mathrm{KMnO}_{4}+\mathrm{H}_{2} \mathrm{SO}_{4} \rightarrow \mathrm{Fe}_{2}\left(\mathrm{SO}_{4}\right)_{3}+\mathrm{K}_{2} \mathrm{SO}_{4}$. The equivalent mass $F e S$ in the above reaction is :
A. $\frac{\mathrm{Mol} \mathrm{wt}}{1}$
B. $\frac{\mathrm{Mol} \mathrm{wt}}{3}$
c. $\frac{\mathrm{Mol} \mathrm{wt}}{3}$
D. $\frac{\mathrm{Mol} \mathrm{wt}}{9}$

## Answer: D

## - Watch Video Solution

## In Chapter Exercise H

1. If 36.44 ml of $0.01652 \mathrm{M} \mathrm{KMnO}_{4}$ solution in acid media is required to completely oxidize 25 ml of a $\mathrm{H}_{2} \mathrm{O}_{2}$ solution. What will be the molarity of $\mathrm{H}_{2} \mathrm{O}_{2}$ solution?
A. 0.0602
B. 0.1204
C. 0.24
D. 0.030

## Answer: A

## - Watch Video Solution

2. A piece of Zn is dissolved in 40 ml of $\frac{N}{10} \mathrm{HCl}$ completely. The excess of acid was neutralized by 15 ml of $\frac{\mathrm{N}}{5} \mathrm{NaOH}$. The weight of Zn which react with HCl is :
A. 65 gm
B. 0.065 gm
C. 0.0325 gm
D. 32.25 gm

## Answer: C

## - Watch Video Solution

3. 5.3 g of $\mathrm{M}_{2} \mathrm{CO}_{3}$ is dissolved in 150 mL of 1 N HCl . Unused acid required 100 mL of 0.5 NaOH . What will be the equivalent mass of M ?
A. 23
B. 12
C. 24
D. 13

## Answer: A

## - Watch Video Solution

4. 0.5 g NaOH was added to 200 ml 0.1 M HCl , final concentration of reactant left is :
A. $3 / 80$
B. $2 / 80$
C. $3 / 40$
D. $5 / 80$

## Answer: A

## - Watch Video Solution

5. $3.92 g$ of ferrous ammonium sulphate crystals are dissolved in 100 ml of water, 20 ml of this solution requires 18 ml of $\mathrm{KMnO}_{4}$ during titration for complete oxidation. The weight of $\mathrm{KMnO}_{4}$ present in one litre of the solution is
A. 34.76 g
B. 12.38 g
C. 1.238 g
D. 3.476 g

## Answer: D

## - Watch Video Solution

6. 25 mL of $2 \mathrm{NHCl}, 50 \mathrm{mLof} 4 \mathrm{NHNO}_{3}$ and $x \mathrm{~mL} 2 \mathrm{MH}_{2} \mathrm{SO}_{4}$ are mixed together and the total volume is made up to 1 L after dilution. 50 mL if this acid ixture completely reacteed with 25 mL of a $1 N N a_{2} C O_{3}$ solution. The value of $x$ is:
A. 25 mL
B. 40 mL
C. 60 mL
D. 50 mL

## Answer: A

7. How many grams of $I_{2}$ are present in a solution which requires 40 mL , of $0.11 \mathrm{~N} \mathrm{Na} 2 \mathrm{~S}_{2} \mathrm{O}_{3}$ to react with it.
A. 12.7 g
B. 0.558 g
C. 25.4 g
D. 11.4 g

## Answer: B

## - Watch Video Solution

8. What will be the volume of $\mathrm{H}_{2} \mathrm{~S}$ released at $0^{\circ} \mathrm{C}$ and 1 atm pressure when 16.6 g of KI reacts with excess of $\mathrm{H}_{2} \mathrm{SO}_{4}$ according to the equation $K I+\mathrm{H}_{2} \mathrm{SO}_{4} \rightarrow \mathrm{I}_{2}+\mathrm{K}_{2} \mathrm{SO}_{4}+\mathrm{H}_{2} S+\mathrm{H}_{-}(2) \mathrm{O}^{`}$.
A. 2.24 lit
B. 280 ml
C. 224 ml
D. 1.12 lit

## Answer: B

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