



CHEMISTRY

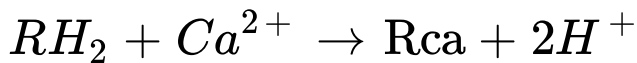
BOOKS - NTA MOCK TESTS

SOME BASIC CONCEPTS OF CHEMISTRY

Multiple Choice Questions

1. RH_2 (ion exchange resin) can replace Ca^{2+}

ions in hard water as:



If 1 L of hard water after passing through RH_2 has $pH = 3$, then hardness in parts per million of Ca^{2+} is :

- A. 10 ppm
- B. 40 ppm
- C. 100 ppm
- D. 20 ppm

Answer: D



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2. 150 mL 0.08 M $BaCl_2$ is added to 100 mL 0.1 M $Al_2(SO_4)_3$ and it is allowed to complete the precipitation reaction. Calculate the molarity of $AlCl_3$ in the final solution.

A. 0.032 M

B. 0.040 M

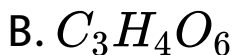
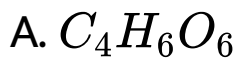
C. 0.120 M

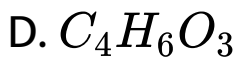
D. 2.240 M

Answer: A



3. 1g silver salt of an organic dibasic acid on heating yields 0.5934 g Ag. If the weight percentage of C in acid is 8 times the weight percentage of hydrogen and one half the weight percentage of oxygen, then determine its molecular formula. ($M_{AgNO_3} = 108$)





Answer: A



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4.2 mol N_2 and 3 mol H_2 are allowed to react in a 20 L flask at 400 K and after the complete conversion of H_2 to NH_3 , 10L H_2O was added and the temperature is reduced to 300 K. The pressure of gas after the reaction is

$N_2 + 3H_2 \rightarrow 2NH_3$ (assume that all the NH_3 formed gets dissolved in water)

A. $3R \times \frac{300}{20}$

B. $3R \times \frac{300}{10}$

C. $R \times \frac{300}{20}$

D. $R \times \frac{300}{10}$

Answer: D



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5. A mixture containing 28 g CaO and 20 g NaOH is treated with aqueous HCl until the reactions complete. The resulting solution is evaporated to dryness. What is the mass of the solid obtained ?

A. 169.50 g

B. 84.75 g

C. 42.37 g

D. 100.0 g

Answer: B



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6. On warming, H_2O_2 in aqueous solution decomposes as



If 1 mol of gas occupies a volume of 25 L under the conditions of measurement, and 200 mL of x M solution of H_2O_2 produces 5 L O_2 , then the value of x is:

A. 0.2

B. 2

C. 1

D. 2.5

Answer: B



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7. A commercial sample of H_2O_2 is marked as 33.6 V. The molarity of H_2O_2 in the sample and the mass of O_2 available from 100 mL sample are, respectively:

A. $1.5M$
 $2.4g$

B. $3M$
 $4.8g$

C. $2M$
 $3.2g$

D. $1M$
 $1.6g$

Answer: B



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8. 25.4 g of iodine and 14.2 g chlorine react to give a mixture of ICl and Icl_3 . How many moles of ICl and Icl_3 are formed, respectively ?

A. $\frac{0.05}{0.05}$

B. $\frac{0.1}{0.05}$

C. $\frac{0.5}{0.5}$

D. $\frac{0.1}{0.1}$

Answer: D



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9. On subjecting 10 ml mixture of N_2 and Co to repeated electric spark to form CO_2 and NO, 7 ml of O_2 was required for combustion. What

was the mole percent of CO in the mixture ?

(All volumes were measured under identical conditions)

A. 4

B. 6

C. 40

D. 60

Answer: D



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10. 0.70 g sample consisting of CaC_2O_4 and MgC_2O_4 is heated at 300 °C to convert the salts to $CaCO_3$ and $MgCO_3$, respectively. The sample then weighs 0.47 g. When the sample is heated to 700 °C, then the products are CaO and MgO, respectively. What is the weight of mixture of the oxides?

A. 0.36 g

B. 0.14 g

C. 0.28 g

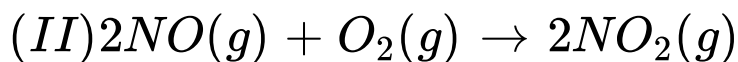
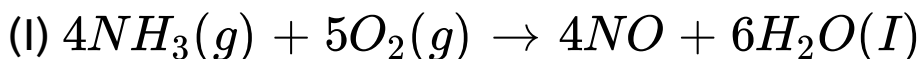
D. 1.08 g

Answer: C

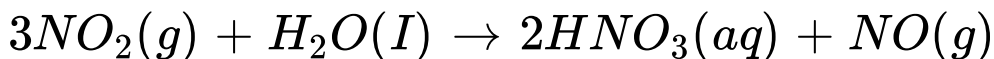


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11. Nitric acid is produced from NH_3 in the following three steps,



(III)



% yield of (I), (II) and (III) are 40%, 60% and

70% respectively, then what volume of NH_3

(g) at 1 atm and 0°C is required to produce 1075 g HNO_3 ?

A. 3413 L

B. 3500 L

C. 6826 L

D. 1750 L

Answer: A



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12. The molecular formula of a commercial resin used for exchanging ions in water softening is $C_8H_7SO_3Na$ (molecular weight = 206). What would be the maximum uptake of Ca^{2+} ions by the resin if expressed in mol per gm?

A. $\frac{1}{412}$

B. $\frac{1}{103}$

C. $\frac{1}{206}$

D. $\frac{2}{309}$

Answer: A



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13. In Carius method of estimation of halogens, 250 mg of an organic compound gave 141 mg AgBr. What is the percentage of bromine in the compound (atomic mass of Ag = 108 and atomic number of Br = 80) ?

A. 60

B. 24

C. 36

D. 48

Answer: B



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14. In the reaction $4A + 2B + 3C \rightarrow A_4B_2C_3$, what will be the number moles of product formed, starting from one mole of A, 0.6 moles of B and 0.72 moles of C ?

A. 0.25

B. 0.3

C. 0.24

D. 2.32

Answer: C



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15. Study the following table.

Compound (Molecular weight)	Weight of compound (taken in g)
(a) CO ₂ (44)	4.4
(b) NO ₂ (46)	2.3
(c) H ₂ O ₂ (34)	6.8
(d) SO ₂ (64)	1.6

Which of these two compounds have the least weight of oxygen in them ?

A. $\begin{matrix} b \\ d \end{matrix}$

B. $\begin{matrix} a \\ c \end{matrix}$

C. $\begin{matrix} a \\ b \end{matrix}$

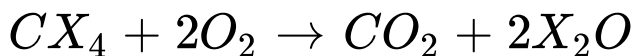
D. $\begin{matrix} c \\ d \end{matrix}$

Answer: A



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16. For the reaction,



0.9g CX_4 completely reacts with 1.74 g

oxygen. The approximate molar mass of X is:

A. 20

B. 40

C. 60

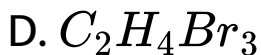
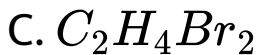
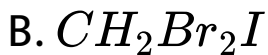
D. 80

Answer: D



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17. A carbon compound contains 12.8% of carbon, 2.1% of hydrogen and 85.1% of bromine. The molecular weight of the compound is 187.9. Calculate the molecular formula of the compound. (Atomic wts: H = 1.008, C = 12.0, Br = 79.9)



Answer: C



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18. If 6.3 g of $NaHCO_3$ are added to 15.0 g CH_3COOH solution. The residue is found to

weigh 18.0g . What is the mass of CO_2 released in this reaction.

A. 1.3 g

B. 8.3 g

C. 3.3 g

D. 10.3 g

Answer: C



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19. How many carbon atoms are present in 0.35 mole of $C_6H_{12}O_6$? (Given: $N_A = 6.023 \times 10^{23}$)

- A. 1.26×10^2 carbon atoms
- B. 1.26×10^{24} carbon atoms
- C. 1.26×10^{14} carbon atoms
- D. 1.26×10^{48} carbon atoms

Answer: B



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20. The vapour density of a mixture containing NO_2 and N_2O_4 is 38.3 at $27^\circ C$. Calculate the mole of NO_2 in 100 g mixture.

A. 0.437 mole

B. 0.7 mole

C. 0.37 mole

D. 0.27 mole

Answer: A



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21. P and Q are two elements which form P_2Q_3 , PQ_2 molecules. If 0.15 mole of P_2Q_3 and PQ_2 weighs 15.9 g and 9.3 g, respectively, what are atomic weights of P and Q respectively.

A. 26,48

B. 16,18

C. 26,28

D. 26,18

Answer: D



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22. Calculate the weight of lime (CaO) obtained by heating 300 kg of 90% pure limestone. ($CaCO_3$).

A. 159.20 kg

B. 181.20 kg

C. 191.20 kg

D. 151.20 kg

Answer: D



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23. Calculate the percentage composition in terms of mass of a solution obtained by mixing 300 g of a 25% and 400 g of a 40% solution by mass.

A. 0.4357

B. 0.2357

C. 0.3357

D. 0.6357

Answer: C



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24. Calculate normality of mixture obtained by mixing : 100 mL of 0.1 N H_2SO_4 + 50 mL of 0.25 N NaOH.

A. 0.167

B. 0.0167

C. 0.17

D. 0.067

Answer: B



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25. How many mL of 2.0 M $Pb(NO_3)_2$, contains 600 mg Pb^{2+} .

A. 1.14 mL

B. 1.94 mL

C. 1.34 mL

D. 1.44 mL

Answer: D



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26. A sample of NaOH weighing 0.38 g is dissolved in water and the solution is made to 50.0 mL in a volumetric flask. What is the molarity of the resulting solution ?

A. 0.29

B. 0.19

C. 0.39

D. 0.9

Answer: B



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27. A solution of glucose in water is labelled as 10 percent $\frac{W}{W}$. If the density of the solution is 1.2gmL^{-1} , then what shall be the molarity of the solution ?

A. 0.17 M

B. 0.67 M

C. 0.6 M

D. 0.76 M

Answer: B



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28. If a pure compound made of X_2Y_3 molecules consists 60% X by weight, then the atomic weight of Y is:

A. 2.25 times the atomic weight of X.

B. 44% of the atomic weight of X.

C. 4.0 times the atomic weight of X

D. 25% of the atomic weight of X.

Answer: B



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29. Equal weight of 'X' (atomic weight=36) and 'Y' (atomic weight= 24) react to form the compound, X_2Y_3 . If that is the case, then

A. X is the limiting reagent

B. Y is the limiting reagent.

C. no reactant is left over and the mass of

X_2Y_3 formed is double the mass of 'X'

taken.

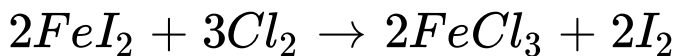
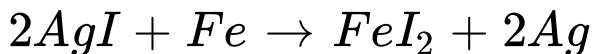
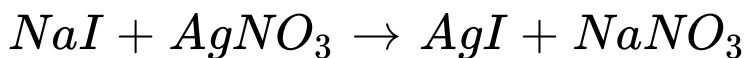
D. none of these apply

Answer: C



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30. The following process has been used to obtain iodine from oil-field brines in California.



How many grams of $AgNO_3$ are required in the first step for every 254 kg I_2 produced in the third step ?

A. 340×10^4

B. 340×10^3

C. 34×10^3

D. 34×10^5

Answer: B



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