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Chapter End Test

(2019-20)

Date : ___/__/2019 Duration : ___ min. Max. Marks : ___	Chemistry Topic : Some Basic Concept of Chemistry	CLASS XI

General Instructions:

- All questions are compulsory.
- Do not write anything in the question paper.
- Use of calculators is not allowed.

[Topic : Low of Chemical Combination]

1. Two gaseous samples were analysed. One contained 1.2g of carbon and 3.2g of oxygen. the other contained 27.3% carbon and 72.7% oxygen. The experimental data are in accordance with

(a) Law of conservation of mass (b) Law of definite proportions

(c) Law of reciprocal proportions (d) Law of multiple proportions

[Topic : Units & Measurements]

2. The highest temperature among the following is

(a) 203°F (b) 278 K (c) 105°C (d) All are equal

[Topic : Molecular Mass]

3. 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:

(a) 199 amu (b) 200 amu (c) 201 amu (d) 202 amu

[Topic : Molecular Formula]

4. The crystalline salt Na_2SO_4. xH_2O on heating losses 55.9% of its weight. The formula of the crystalline salt is

(a) $Na_2SO_4.5H_2O$ (b) $Na_2SO_4.7H_2O$ (b) $Na_2SO_4.2H_2O$ (c) $Na_2SO_4.10H_2O$

5. Two elements X (atomic weight = 75) and Y (atomic weight = 16) combine to give a compound having 75.8% of X. The formula of the compound is

(a) XY (b) X_2Y (c) XY_2 (d) X_2Y_3

[Topic : Stoichiometry]

6. The decomposition of a certain mass of $CaCO_3$ gave 11.2 dm^3 of CO_2 gas at STP. The mass of KOH required to completely neutralize the gas is

(a) 56 g (b) 28 g (c) 42 g (d) 20 g

7. 250 ml of a sodium carbonate solution contains 2.65 grams of Na_2CO_3. If 10 ml of this solution is diluted to one litre, what is the concentration of the resultant solution? (mol. wt. of Na_2CO_3 = 106)

(a) 0.1 M (b) 0.001 M (c) 0.01 M (d) 10^{-4} M

8. How much of NaOH is required to neutralise 1500 cm^3 of 0.1M HCl? (Na = 23)

(a) 40 g (b) 4 g (c) 6 g (d) None

9. If 30 ml of H_2 and 20 ml of O_2 react to form water, what is left at the end of the reaction?

(a) 10 ml of H_2 (b) 5 ml of H_2 (c) 10 ml of O_2 (d) 5 ml of O_2

[Topic : Concentration of solutions]

10. 5.3 g of Na_2CO_3 have been dissolved to make 250 cc of the solution. The molarity of the resulting solution will be

(a) 0.1 M (b) 0.2 M (c) 0.4 M (d) 0.8 M

11. 0.06 moles of Na_2SO_4 are dissolved in 250 cc solution. The molarity of Na_2SO_4 solution is

(a) 0.03 (b) 0.06 (c) 0.24 (d) 0.12

12. Calculates the amount of H_2SO_4 which must be added to 100 ml H_2O to make it 0.02 M solution

(a) 0.98 g (b) 0.196 g (c) 0.49 g (d) 0.245 g

13. Which is preferred for representation of concentration of a solution.

(a) Normality (b) Molarity (c) Molality (d) All of these

14. A compound has hemoglobin like structure. It has one Fe per molecule. It contain 4.6% of Fe. The approximate molecular mass is

(a) 100 g mol^{-1} (b) 1200 g mol^{-1} (c) 1400 g mol^{-1} (d) 1600 g mol^{-1}

15. How many moles of lead (II) chloride will be formed from a reaction between 6.5 g of PbO and 3.2 g of HCl?

(a) 0.044 (b) 0.333 (c) 0.011 (d) 0.029

16. When equal mass of CH_4 and O_2 are mixed then the mole fraction of CH_4 is

(a) $\frac{1}{16}$ (b) $\frac{2}{16}$ (c) $\frac{3}{2}$ (d) $\frac{2}{3}$

[Topic : Mole concept]

17. Number of moles in 1 m^3 gas at STP are

(a) 4.46 (b) 44.6 (c) 446 (d) 4460

18. The number of molecules present in 8 g of oxygen gas

(a) 6.022×10^{23} (b) 3.011×10^{23} (c) 12.044×10^{23} (d) 1.55×10^{23}

19. Which of the following has the largest number of atoms?

(a) 0.5 g atom of Cu (b) 0.635 g of Cu

(c) 0.25 moles of Cu atom (d) 1 g of Cu

20. 7.5 grams of a gas occupy 5.6 litres of volume at STP. The gas is

(a) NO (b) N_2O (c) CO (d) CO_2

21. The number of atoms in 0.1 mol of a triatomic gas is ($N_A = 6.02 \times 10^{23}$ mol^{-1})

(a) 1.8×10^{22} (b) 6.026×10^{22} (c) 1.806×10^{23} (d) 3.6×10^{23}

22. One mole of CO_2 contains

(a) 6.02×10^{23}atoms of C (b) 6.02×10^{23} atoms of O

(c) 18.1×10^{23}molecules of CO_2 (d) 3g atoms of CO_2

23. If 10^{21} molecules are removed form 200 mg of CO_2, then the number of moles of CO_2 left are

(a) 2.88×10^{-3} (b) 1.66×10^{-3} (c) 4.54×10^{-3} (d) 1.66×10^{-2}

24. The number of gram molecules of oxygen in 6.02×10^{24} CO molecules is

(a) 10g molecules (b) 5g molecules (c) 1g molecule (d) 0.5g molecule.

25. Which of the following contains maximum number of molecules?

(a) 100 cc of CO_2 at STP (b) 150 cc of N_2 at STP

(c) 50 cc of SO_2 at STP (d) 250 cc of O_2 at STP

[Topic : Molecular Mass]

26. (i) How are 0.50 mol Na_2CO_3 and 0.50M Na_2CO_3 different?

(ii) Calculate the overage atomic mass of chlorine from the following data: **[1+2=3]**

Isotope	***% Natural abundance***	***Atomic Mass***
^{35}Cl	75.77	34.9689 u
^{37}Cl	24.23	36.9659 u

[Topic : Stoichiometry]

27. Chlorine is prepared in the laboratory by treating manganese dioxide (MnO_2) with aqueous hydrochloric acid according to the reaction: **[3]**

$4HCl\ (aq.) + MnO_2\ (s) \rightarrow MnCl_2(aq.) + Cl_2 + 2H_2O$

How many grams of HCl react with 5.0g of MnO_2. (atomic mass of Mn = 55g)

[Topic : Mole Concept]

28. Calculate the No. of atoms present in : **[3]**

(a) 52 moles of He (b) 52 u of He (c) 52 g of He

[Topic : Molecular Formula]

29. Two metallic oxides contain 27.6% and 30% oxygen respectively. If the formula of the first oxide is M_3O_4. That of the second will be?

[Topic : Limiting Reagent]

30. (a) An organic compound has the following percentage composition; C = 48%, H = 8%, N = 28%. Calculate the empirical formula of the compound. **[3]**

(b) In a reaction $A + B_2 \rightarrow AB_2$. Identify the limiting reagent, if any, in the following reaction mixtures. **[2]**

(i) 2 mol A + 3 mol B

(ii) 100 atoms of A + 100 molecules of B

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Solutions to Chapter End Test

(2019-20)

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1.	(b)	2.	(c)	3.	(b)	4.	(d)	5.	(d)
6.	(a)	7.	(c)	8.	(c)	9.	(d)	10.	(b)
11.	(c)	12.	(b)	13.	(c)	14.	(b)	15.	(d)
16.	(d)	17.	(b)	18.	(d)	19.	(a)	20.	(a)
21.	(c)	22.	(a)	23.	(a)	24.	(b)	25.	(?)

26. (i) Molar mass of Na_2CO_3 = 2 × 23 + 12 + 3 ×16 = 106 g/mol

0.50 mol Na_2CO_3 means = 0.50 × 106 g = 53 g

0.50 M Na_2CO_3 means 0.50 mol i.e., 53 g Na_2CO_3 are present in 1 L of the solution.

(ii) Average atomic mass $= \frac{(75.77\times34.9689) + (24.23\times36.965)}{(75.77 + 24.23)} = 35.45$ u

27. 4 HCl + $MnO_2 \rightarrow MnCl_2 + Cl_2 + 2H_2O$

4(36.5) 87g

87g of MnO_2 react with HCl = 146 g

5g of MnO_2 react with HCl $= \frac{146}{87}\times5 = 8.39$ g

28. (a) 1 mole of He = 6.022×10^{23}

52 moles of He = $6.022 \times 10^{23} \times 52$

= 3.13×10^{25}

(b) '4 u' is the mass of He atoms = 1

52 u is the mass of He atoms $= \frac{52}{4} = 13$ atoms

(c) 4 g of He contain atoms = 6.022×10^{23}

52 g of He contain atoms = $\frac{6.022\times10^{23}\times52}{4}$ = 7.83×10^{24} atoms

29. Formula M_3O_4 :

27.6 parts → 4 oxygen atoms

30 parts → $\frac{4\times30}{27.5} = 4.3478$

72.4 parts → 3 metal atoms

70 parts → $\frac{3\times70}{72.4} = 2.9$

M : O Ratio : 2.9 : 4.3478

1 : 1.5 M_2O_2

30. (a) Percentage of C = 48% Percentage of H = 8%

Percentage of N = 28% Percentage of O = 16%

Element	*%*	*At. mass*	*Gram atoms*	*Atomic Ratio*	*Simplest whole No. ratio*
C	48.0	12	$\frac{48.0}{12} = 4$	$\frac{4}{1} = 4$	4
H	8.0	1	$\frac{8.0}{1} = 8$	$\frac{8}{1} = 8$	8
N	28.0	14	$\frac{28.0}{14} = 2$	$\frac{2}{1} = 2$	2
O	16.0	16	$\frac{16}{16} = 1$	$\frac{1}{1} = 1$	1

Empirical formula = $C_4H_8N_2O$

(b) A is the limiting reagent.

No limiting reagent

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