**ALVA’S PRE UNIVERSITY COLLEGE, MOODBIDRI**

**DEPARTMENT OF CHEMISTRY**

**CET / NEET CRASH COURSE-2020**

**TOPIC: SOME BASIC CONCEPTS OF CHEMISTRY-C01**

1. One litre of a gas at STP weight 1.16 *g* it can possible be

1)  2) 3) 4)

**Ans:1** 1*L* of gas at S.T.P. weight 1.16*g*

**** 22.4 *L* of gas at S.T.P. weight 



This molecular weight indicates that given compound is 

1. The equivalent weight of an element is 4. Its chloride has a V.D 59.25. Then the valency of the element is

1) 4 2) 3 3) 2 4) 1

**Ans:2** Valency of the element 

=3.

1. 1.25 *g* of a solid dibasic acid is completely neutralised by 25 *ml* of 0.25 molar solution. Molecular mass of the acid is

1)100 2)150 3)120 4)200

**Ans:4** Molarity 

****

**** Molecular weight .

1. If NA is Avogadro’s number then number of valence electrons in 4.2g of nitride ions () is

1) 2.4 2) 4.2 3) 1.6 4) 3.2

Ans: (1)

No of moles of nitride ion = nitride ions

Valence electrons = 8 = 2.4 (5+3 due to charge). One ion contains 8 valence electrons.

1. Which of the following statement is correct ?

1. There is no difference between Precision and Accuracy

2. A good precision always means good accuracy

3. Accuracy means that all measured values of an experiment are close to the actual value

4. **A measurement may have good accuracy but poor precision**

Ans: (4)

Good accuracy means that average value of meas­urements is close to the actual value. Different measurements may not be close to each other (which is a condition for precision).

1. Ratio of and of a gas X is 1.4, the number of atom of the gas ‘X’ present in 11.2 litres of it at NTP will be

1)  2)  3) 4)

**Ans:1**  so, given gas is diatomic

11.2*L *molecules

 No. of atoms  *atoms*

1. A 5 molar solution of is diluted from 1 litre to a volume of 10 litres, the normality of the solution will be:

1) 1N 2) 0.1N 3) 5N 4) 0.5N

Ans: (1)

5, ( Basicity of = 2)

,

or

1. Haemoglobin contains 0.334% of iron by weight. The molecular weight of haemoglobin is approximately 67200. The number of iron atoms (at. Wt. of Fe is 56) present in one molecule of haemoglobin are

1) 1 2) 6 3) 4 4) 2

Ans: (3)

Given : Percentage of iron = 0.334%;

Molecular weight of the haemoglobin = 67200 and atomic weight of iron = 56.

We know that the number of iron atoms =

=

1. The correctly reported answer of the addition of 4.523, 2.3 and 6.24 will have significant figures

1)Two 2) **Three**  3) Four 4) five.

Ans: (2)

4.523 + 2.3 + 6.24 =13. 063. As 2.3 has least no. of decimal places, i.e., one, therefore sum should be reported to one decimal place only. After rounding off, reported sum = 13.1 which has three sig­nificant figures.

1. The mass of carbon anode consumed (giving only carbondioxide) in the production of 270 kg of aluminium metal from bauxite by the Hall process is (Atomic mass: Al = 27)

1) 270 kg 2) 540 kg 3) 90 kg 4) 180 kg

Ans: (3)

2Al2O3 + 3C Al +3CO2

Gram equivalent weight Al = = 9

Equivalent weight of C = 

No of gram equivalent of Al = = 30

Again, No. of gram equivalent of C =

30 =

mass = 90 g =

1. Irrespective of the source, pure sample, of water always yields , 88.89% mass of oxygen and 11.11% mass of hydrogen. This is Explained by the law of

1) conservation of mass 2) multiple proportions

3)  **constant composition**  4) constant volume

Ans: (3)

The H : Oratio in water is fixed, irrespective of its source. Hence it is law of constant composition.

1. In Haber process 30litres of dihydrogen and 30 litres of dinitrogen were taken for reaction which yielded only 50% of the expected product. What will be the composition of gaseous mixture under the aforesaid condition in the end?

1) 20 litres ammonia, 25 litres nitrogen, 15 litres hydrogen

2) 20 litres ammonia, 20 litres nitrogen, 20 litres hydrogen

3) 10 litres ammonia, 25 litres nitrogen, 15 litres hydrogen

4) 20 litres ammonia, 10 litres nitrogen, 30 litres hydrogen

Ans: (3)

N2 + 3H2 2NH3

1 vol. 3 vol. 2 vol.

10 litre 30 litre 20 litre

It is given that only 50% of the expected product is formed hence only 10 litre of NH3 is formed

N2 used = 5 litres, left = 30 - 5=25 litres

H2 used = 15 litres, left = 30-15=15 litres

1. Two samples of lead oxide were separately reduced to metallic lead by heating in a current of hydrogen. The weight of lead from one oxide wAS half the weight of lead obtained from the other oxide. The data illustrate

1)law of reciprocal proportions 2)law of constant proportions

**3)law of multiple proportions 4)**law of equivalent proportions

Ans: 3.

This shows that the weights of lead combining with fixed weight of oxygen are in the ratio :1or 1 :2 which is in accordance with law of multiple propor­tions.

1. In a experiment its showed that 10 mL of 0.05 M solution of chloride required 10 mL of 0.1 M solution of AgNO3, which of the following will be the formula of the chloride (X = stands for the symbol of the element other than chlorine) :

1) 2) 3) )

Ans: (3) .

Millimoles of solution of chloride = 0.0510=0.5 Millimoles of AgNO3 solution= 100.1=1

So, the millimoles of AgNO3 are double than the chloride solution.

XCl2 + 2AgNO3 2AgCl + X(NO3)2.

1. A 400 mg iron capsule contains 100 mg of ferrous fumarate, . The percentage of iron pasent in it is approximately

1)33% 2) 25% 3)14% 4)8%

Ans: (4) .

Molecular weight of 

Fe present in 100mg of 



This is present in 400mg of capsule

% of Fe in capsule .

1. An element, X has the following isotopic composition:

200X : 90% 199X : 8.0% 202X : 2.0%

The weighted average atomic mass of the naturally occurring X is closest to

1) 201 amu 2) 202 amu 3) 199 amu 4) 200 amu

Ans: (4)

Average isotopic mass of X =

= =

1. What volume of oxygen gas (O2) measured at 0 and 1 atm, is needed to burn completely 1L of propane gas (C3H8) measured under the same conditions?

1) 7L 2) 6 L 3) 5 L 4) 10 L

Ans: (3)

Writing the equation of combustion of propane (C3H8), we get

C3H8 + 5O2 3CO2 + 4H2O

1 Vol 1L 5 Vol 5L

From the above equation we find that we need 5L of oxygen at NTP to completely burn 1L of propane at N.T.P.

If we change the conditions for both the gases from N.T.P. to same conditions of temperature and pressure. The same results are obtained. i.e 5L is the correct answer.

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

1) 0.044 2) 0.333 3) 0.011 4) 0.029

Ans: (4)

Writing the equation for the reaction, we get

PbO + 2HCl PbCl2 + H2O

207+16 236.5 207+71

= 223g = 73g = 278g

From this equation we find 223g of PbO reacts with 73 g of HCl to from 278g of PbCl2. If we carry out the reaction between 3.2g HCl and 6.5g PbO.

Amount of PbO that reacts with 3.2 g HCl =

Since amount of PbO present is only 6.5g so PbO is the **limiting reagent.**

Amount of PbCl2 formed by 6.5g of PbO =

No of moles ofPbCl2 formed = moles = **0.029 moles**

1. In the final answer of the expression the number of significant figure is:

1) 1 2) 2 3) 3 4) 4

Ans: (3)

On the calculation we find

As the least precise number contains 3 significant figures therefore answers should also contains 3 significant figures.

1. Four one-litre flasks are separately filled with the gases hydrogen, helium, oxygen and ozone at the same room temperature and pressure. The ratio of total number of atoms of these gases present in the different flasks would be

1) 1 : 1 : 1 : 1 2) 1:2:2:3 3) **2: 1:2:3** 4) *3* :2:2:1

Ans: (3)

Equal volumes contain equal no. of molecules. hence, no. of atoms of H2, He, O2 and O3 will be in the ratio 2: 1 2: 3.

1. To neutralise completely 20 mL of 0.1 M aqueous solution of phosphorous acid (H3P03), the value of 0.1 M aqueous KOH solution required is

1) **40 mL** 2) 20mL 3) 10 mL 4) 60mL

Ans: (1)

N1 V1 = N2V2

(Note : H3PO3 is dibasic M = 2N)

20 x 0.2 =0.1V (Thus. 0.1 M = 2 N)

V.= 40 ml

1. The approximate atomic weight of a metal having specific heat 0.32 is

1)10 2) **20** 3)32 4) 64

Ans: (2)

By Dulong Petit’s law :

Atomic weight x 0.32 = 6.4

Atomic weight = = 20

1. The number of moles of oxygen In one litre of air containing 21% oxygen by volume, in standard conditions, is :

1) 0.186 mole 2) 0.21 mole 3) 2.10 mole 4)**0.0093 mole**

Ans: (3)

1 L of air = 210 cc of O2, 22400= is 1 mol.

210

Hence, 210 cc = ----------- =0.0093 mol.

22400

1. A compound contains 38.8% C, 16.0% II and 45.2% N. The formula of the compound would be

1)CH 3NH2 2) CH3CN 3)C2H5CN 4) **CH2(NH)2**

Ans: (4)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Element | % | At. wt. | %/At. wt | Ratio |
| C | 38.8 | 12 | 323 | 1 |
| H | 16.0 | 1 | 16.0 | 5 |
| N | 45.2 | 14 | 3.23 | 1 |

E.F. = CH5N = CH3NH2

1. One part of an element A combines with two parts of another element B. Six parts of the element C combine with four parts of the element B. If A and C combine together, the ratio of their weights will be governed by

1)law of definite proportions 2)law of multiple proportions

**3)law of reciprocal proportions 4)**law of conservation of mass

Ans: (3)

Law of reciprocal proportions (by definition).

1. The weight of slaked lime necessary to decompose completely 1.07g of ammonium chloride is

1)**0.74g** 2)1.48g 3) 7.4g 4) 0.37g

Ans: (1)

2NH4Cl + Ca(OH)2 → CaCl2 + 2NH3 + 2H2O

2×53.5g 74g

107g

1.07g of NH4Cl ≡ 0.74g of Ca(OH)2

1. In alkaline medium, KMnO4 reacts as follows : 2 KMnO4 + 2 KOH 2 K2MnO4 + H2O + O Therefore, the equivalent weight of KMnO4 will be

1) 31.6 2)52.7 3) 7.0 4) 158.0

Ans: 4

2 KMnO4 = O

2 (158) 16 parts

8 parts O = 158 parts of KMnO4.

Hence, eq. wt. = 158

1. 280 ml of sulphur vapour at NTP weigh 3.2g. The molecular formula of the sulphur vapour is

1) S 2) S2 3) S4 4) **S8**

Ans: (4)

3.2g 280 mL

? 22400 mL ? = 256g

Molecular mass of Sx = x × 32 x = = 8

1. 5.3 g of Na2CO3 have been dissolved to make 250 cc of the solution. The normality of the resulting solution will be

1)0.1 N 2) 0.2 N 3) **0.4 N** 4) 0.8 N

Ans: (3)

Eq.mass of Na2CO3 = 106/2 = 53

Normality = × = × = 0.4 N

1. In an experiment, 20 ml of decinormal HCl solution was added to10 ml of a decinormal AgNO3 solution. AgCl was precipitated out and excess acid was titrated against a decinormal NaOH solution, volume of NaOH required for this back titration is

1)**10 mL** 2)5 mL 3) 20 mL 4) 30 mL

Ans: (1)

10 mL 0.1 N AgNO3 will react with 10 mL of 0.1 N HCl

Therefore 0.1 N HCl left = 10 mL

It will neutralize 10 mL of 0.1 N NaOH

1. What is the normality of 1M solution of H3PO4

1) 0.5 N 2) 1 N 3) 2 N 4) **3 N**

Ans: (1)

Normality = Molarity × basicity = 1 × 3 = 3 N

1. 5 ml of 1N HCl, 20 ml of N/2 H2SO4 and 30 ml of N/3 HNO3 are mixed together and the volume made to 1 litre. The normality of the resulting solution is,

1) N/5 2)N/10 3) N/28 4)**N/40**

Ans: (4)

N1V1 + N2V2+ N3V3 = N4(V1 +V2+V3)

1×5+0.5×20+0.33×30 = N4(5 +20+30)

5+10+10 = N4(55) N4 = 25/55 = 0.45 N N2 = 0.0249 N = N/40

N1V1 = N2V2 ------- 0.45 × 55 = N2 × 1000

Before After

1. The mass of CaO that shall be obtained by heating 20 kg of 90% pure limestone (CaCO3) is

1) 11.2 kg 2) 8.4 kg 3) **10.08 kg**  4) 16.8 kg

Ans: (3)

CaCO3 → CaO + CO2

100kg 56kg

Pure limestone in 20 kg = 90% of 20 = 18 kg

100 kg 56 kg

18 kg ?

= 10.08 kg

1. The oxide of an element possesses the formula M2O3. If the equivalent weight of the metal is 9,then the atomic weight of the metal will be

1) 9 2) 18 3) **27**  4) none of these.

Ans: (3)

According to the formula M2O3, valency of M = 3.

Hence atomic wt. = Eq. wt. x valency .9x3=27.

1. Atomic masses of elements are usually fractional because

1) These are mixtures of isotopes 2) They contain impurities of other atom

3) They are mixture of isobars 4) Atomic masses cannot be weighed accurately

Ans: 1

1. Zinc sulphate contains 22.65% of zinc and 43.9% of water of crystallization. If the law of constant proportions is true, then the weight of zinc required to produce 20 g of the crystals will be

1) 45.3 g 2) 4.53 g 3) 0.453 g 4)453 g

Ans: 2 100 g of ZnSO4 crystals are obtained from =22.65g Zn

1g of ZnSO4 crystals will be obtained from Zn

20 g of ZnSO4 crystals obtained from 

1. 10 of gas and 10 of gas *X* at the same temperature contain the same number of molecules. The gas *X* is

1)  2)  3)  4)*NO*

Ans: 1

If same volume is occupied by the gas, the no. of molecules are same, so no. of moles are same.

1mole of  gas ****

1 mole of  gas 

1. The set of numerical coefficient that balances the equation is

1) 1, 1, 2, 2, 1 2) 2, 2, 1, 1, 1 3) 2, 1, 1, 2, 1 4)2, 2, 1, 2, 1

Ans: 4, 

1. One litre hard water contains 12.00 *mg* milli equivalent of washing soda required to remove its hardness is

1) 1 2) 12.15 3) 4)

Ans: 1

Meq of Meq of washing soda

**** ****; ****

****.

1. Read the assertion and reason carefully to mark the correct option out of the options given below :

Assertion : Equivalent weight of  in  is 63.6 and in 31.8.

Reason : Equivalent weight of an element 

1) If both assertion and reason are true and the reason is the correct explanation of the assertion.

2) If both assertion and reason are true but reason is not the correct explanation of the assertion.

3) If assertion is true but reason is false.

4) If assertion is false but reason is true.

Ans:4

Equivalent wt. of *Cu* in  *CuO* ==31.8

Equivalent wt. of *Cu* in =63.6

(Valency of *Cu* =1).

1.  of  on decomposition produced phosphorus and hydrogen. The change in volume is

1)  increase 2)  decrease 3) decrease 4) Nil.

Ans:4



Increase in volume increase.

1. About 27 g of Al will react completely with how many grams of oxygen?

1) 8g 2) 16g 3)32g **4) 24g**

Ans: 4) 4Al + 3O2→2Al2O3

At.wt. of Al=27, thus 4x27 g of Al reacts with oxygen=3x32g

∴27 g of Al reacts with oxygen=x27=24g

1. Which of the following two oxides of nitrogen have 30.5% nitrogen?
2. NO 2) NO2 3) N2O4  **4) Both 2 & 3**

**Ans : 4) % of nitrogen in NO2**

**% of nitrogen in N2O4**

1. Insulin contains 3.4% sulphur. Then, the minimum molecular mass of the insulin is about :
2. **940 amu**  2) 9400 amu 3) 3600 amu 4) 970 amu

**Ans : 1) 3.4 g sulphur is present in 100 g insulin**

**32 g sulphur will be present in g insulin = 940**

**Molar mass of insulin is about 940 amu**

1. In the reaction , the equivalent weight of (mol. wt. = M) is equal to

1)M 2)  3) 4)

Ans : 1) 





1. Which one of the following pairs of compounds illustrates the law of multiple proportion

1)  2) MgO, 3) 4)

Ans : 4

1. If is Avogadro’s number then number of valence electrons in 4.2 g of nitride ions 

1)2.4  2) 4.2  3) 4)

Ans : 1

14 gm ions have  valence electrons

4.2gm of  ions have 

1. What should be the equivalent weight of phosphorous acid, if P=31; O=16; H=1

1)82 2) 41 3)20.5 4)None of these

Ans : 1 The acid is dibasic.

Molecular weight of 

 Equivalent weight = 41.

1. Caffeine has a molecular weight of 194. If it contains 28.9% by mass of nitrogen, number of atoms of nitrogen in one molecule of caffeine is

1) 4 2) 6 3)2 4)3

Ans : 1

100gm caffeine has 28.9gm nitrogen

194gm caffeine has = 

 No. of atoms in caffeine .

1. One gram of hydrogen is found to combine with 80g of bromine one gram of calcium valency=2 combines with 4g of bromine the equivalent weight of calcium is

1) 10 2) 20 3)40 4)80

Ans : 2, One gram of hydrogen combines with 80gm of bromine.

So, equivalent weight of bromine = 80gm

 4gm of bromine combines with 1gm of Ca

 80gm of bromine combines with = .

1. What quantity of ammonium sulphate is necessary for the production of gas sufficient to neutralize a solution containing 292 g of ? [HCl=36.5; =132; =17]

1) 272 g 2) 403 g 3)528 g 4)1056 g

Ans : 3,







1.  reacts with oxalic acid according to the equation, , here 20 ml of 0.1 M  is equivalent to

1) 20 *ml* of 0.5 *M * 2)50 *ml* of 0.1 *M *  3)50 *ml* of 0.5 *M * 4)20 *ml* of 0.1 *M *

Ans : 2,  Oxalic acid

; ; .

1. An electric discharge is passed through a mixture containing 50 *c.c.* of and 50 *c.c*. of . The volume of the gases formed (i) at room temperature and (ii) at 1100C will be

1) (i) 25 *c.c.* (ii) 50 *c.c.* 2) (i) 50 *c.c.* (ii) 75 *c.c.* 3)(i) 25 *c.c.* (ii) 75 *c.c.* 4)(i) 75*c.c.* (ii) 75 *c.c.*

Ans : 3,At room temperature 

*t* =0 50*ml* 50*ml* 0

*t* =*t* 50 – 2*x*  50 – *x* 2*x*

=0 25*gases* (50)liquid

In this case is limiting reagent *x* = 25*ml*

At 110°*C * 

*t* =*t* 0 25*ml* 50*ml*

1. 1.12 ml of a gas is produced at STP by the action of 4.12 mg of alcohol, with methyl magnesium iodide. The molecular mass of alcohol is

1)16.0 2)41.2 3)82.4 4)156.0

Ans : 3 

1.12 mL is obtained from 4.12 mg

∴ 22400 mL will be obtained from 

1. 4 g of copper was dissolved in concentrated nitric acid. The copper nitrate on strong heating gave 5 g of its oxide. The equivalent weight of copper is

1) 23 2) 32 3) 12 4) 20

Cu = 4 g, CuO = 5 g . Oxygen = 1 g. Thus, 1 g oxygen combines with Cu = 4 g.

8 g oxygen will combine with Cu = 4 x 8 = 32 g

Eq. Wt. Cu is =32

1. . Number of atoms of He in 100 amu of He (atomit weight of He is 4) is

1) **25** 2)100 3)50 4) 100 x 6 x 10-23

Ans : 3

4 amu of He = 1 atom of He

100 atoms

100 amu of He = --------- = 25 atoms

4

1. A gas mixture contains 50% helium and 50% methane by volume. What is the percent by weight of methane in the mixture ?

1) 19.97% 2) 20.05% 3) 50% 4) **80.03%**

Ans : 4

Equal volumes contain equal number of moles. Hence, molar ratio of He : CH4 = 1 : 1

Ratio by weight = 4 : 16 = 1 : 4

CH4 present by weight = 5 x 100 = 80%.

1. An alkaloid contains 17.28% of nitrogen and its molecular mass is 162. The number of nitrogen atoms present in one molecule of the alkaloid is

1)five 2) four 3) three 4) **Two**

14x

Ans : 2 Suppose one molecule of the alkaloid contains *X* N-atoms. Then % of N = --------- X 100=17.28

162 *X=2*

1. 18 carat gold contains

1)18% Gold 2) 24% Gold 3) **75% Gold** 4)60% Gold

Pure gold is 24 carat. Hence,

18

18 carat gold = ------100% Gold= 75% Gold

1. The empirical formula of an acid is CH2O2, the probable molecular formula of acid may be :

1) C3H6O4 2) CH2O 3)**CH2O2** 4**)** C2H4O2

Ans : 3

The acid with empirical formula CH2O2 is formic acid, H-COOH.

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