YAKEEN NEET 2.0

2026

Some Basic Concept of Chemistry

MPQ Solution - 09 | **Physical Chemistry**

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Magarmach Practice Questions (MPQ)

QUESTION – (AIIMS 1999)

60 g of organic compound on analysis gave following results C = 24 g, H = 4 g and O = 32 g. The empirical formula of compound is:

A. CH_2O

B. CH_2O_2

C. C_2H_2O

D. $C_2H_2O_2$

$C_{\frac{24}{12}}^{2} H_{\frac{4}{1}}^{4} O_{\frac{32}{16}}^{2}$

$C_2H_4O_2$.

$C_{\frac{2}{2}}^{1} H_{\frac{4}{2}}^{2} O_{\frac{2}{2}}^{1}$

CH_2O

Question

Determine the empirical formula of Kevlar, used in making bullet proof vests, is 70.6% C, 4.2% H, 11.8% N and 13.4% O:

A $C_7H_5NO_2$

B $C_7H_5N_2O$

C C_7H_9NO

D C_7H_5NO

$C_{\frac{70.6}{12}}\ H_{\frac{4.2}{1}}\ N_{\frac{11.8}{14}}\ O_{\frac{13.4}{16}}$

$C_{\frac{5.88}{0.84}}\ H_{\frac{4.2}{0.84}}\ N_{\frac{0.84}{0.84}}\ O_{\frac{0.84}{0.84}}$

C_7H_5NO

Question (NCERT: PL-19 | JEE Main April 05, 2024 (I))

An organic compound has 42.1% carbon, 6.4% hydrogen and remainder is oxygen. If its molecular weight is 342, then its molecular formula is :

(A) $C_{11}H_{18}O_{12}$

(B) $C_{12}H_{20}O_{12}$

(C) $C_{14}H_{20}O_{10}$

(D) $C_{12}H_{22}O_{11}$

$C_{\frac{42.1}{12}}\ H_{\frac{6.4}{1}}\ O_{\frac{51.5}{16}}$

$C_{3.5}\ H_{6.4}\ O_{3.2}$

$C_{\frac{3.5}{3.2}}\ H_{\frac{6.4}{3.2}}\ O_{\frac{3.2}{3.2}}$

$1.1 \quad 2 \quad 1$

$M.F. = C_{11}H_{22}O_{11} = E.F.$

$M.F. = (E.F.)_x$

$x = \frac{342}{332} \approx 1$

132
22
178
332

Question

Two oxides of metal contain 27.6% & 30% of oxygen. If the formula of first oxide is M_3O_4. Find formula of second oxide.

27.6% ox.
73.4% metal.
M_3O_4

27.6% ox = 4 at.

30% — $= \frac{4 \times 30}{27.6}$

$= \frac{120}{27.6} = 4.34$

73.4% metal = 3 atoms

70% — $= \frac{3 \times 70}{73.4}$

$= 2.9$

30% ox.
70% metal
M_xO_y

M	O
2.9	4.35
1.45	1.45
2	3

M_2O_3

Question (NCERT: PL-19 | NV, JEE Main Jan. 25, 2023 (II))

Number of hydrogen atoms per molecule of a hydrocarbon A having 85.8% carbon is ____12____ (Given : Molar mas of A = 84 g mol^{-1})

mass of $C = \frac{85.1}{100} \times 84 = 72g$

$\longrightarrow H = 84 - 72 = 12g$

$C_{\frac{72}{12}}^{6} H_{\frac{12}{1}}$ = 12 atoms of H

Question (NCERT: PL-19 | JEE Main June 28, 2022 (II))

Compound A contains 8.7% Hydrogen 74% Carbon and 17.3% Nitrogen. The molecular formula of the compound is,
Given : Atomic masses of C, H and N are 12, 1 and 14 amu respectively.
The moalr mass of the compound A is 162 g mol^{-1}.

(A) $C_4H_6N_2$

(B) C_2H_3N

(C) C_5H_7N

(D) $C_{10}H_{14}N_2$

$C_{\frac{74}{12}}\ H_{\frac{8.7}{1}}\ N_{\frac{17.3}{14}}$

$C_{\frac{6.16}{1.24}}\ H_{\frac{8.7}{1.24}}\ N_{\frac{1.24}{1.24}}$

$C_5H_7N = E.F.$

$M.F. = (E.F.)_x$

$= (C_5H_7N)_2$

$= C_{10}H_{14}N_2$

$x = \frac{162}{5\times12+7\times1+1\times14}$

$= \frac{162}{81} = 2$

Question (NCERT: PL-19 | JEE Main April 12, 2023 (I))

A metal chloride contains 55.0% of chlorine by weight. 100 mL vapours of the metal chloride at STP weight 0.57 g. The molecular formula of the metal chloride is (Given : Atomic mass of chlorine is 35.5 u)

$M_x Cl_y$ (g)

45% 55%

V = 100 ml

STP

T = 273 K

P = 1 atm

mass = 0.57 g

$PV = nRT$

$1 \times \frac{100}{1000} = \frac{0.57}{M} \times 0.0821 \times 273$

$M = 5.7 \times 0.0821 \times 273$

$M = 127.8$ g

(A) MCl_2

(B) MCl_4

(C) MCl_3

(D) MCl

Cl mass $= \frac{55}{100} \times 127.8$

$\simeq 71$ g

Cl_2

$\frac{71}{35.5}$

THANK YOU