YAKEEN NEET 2.0

2026

Some Basic Concept of Chemistry

MPQ Solution - 04 | **Physical Chemistry**

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Question

Find the number of atoms in

			A.A.M.	no. of atoms
A	96 a.m.u. of O,	$^{16}_{8}O$	16 u	$\frac{96}{16} = 6$
B	96 a.m.u. of C,	$^{12}_{6}C$	12 u	$\frac{96}{12} = 8$
C	96 u of S,	$^{32}_{16}S$	32 u	$\frac{96}{32} = 3$
D	168 u of Fe,	$^{56}_{26}Fe$	56 u	$\frac{168}{56} = 3$

Question

Find the number of molecules in:

(a) 132 a.m.u. of CO_2, (R.M.M. of CO_2 = 44)

(b) 128 a.m.u. of SO_2, ($^{32}_{16}S$, $^{16}_{8}O$)

(c) 85 u of NH_3, (R.M.M. of NH_3 = 17)

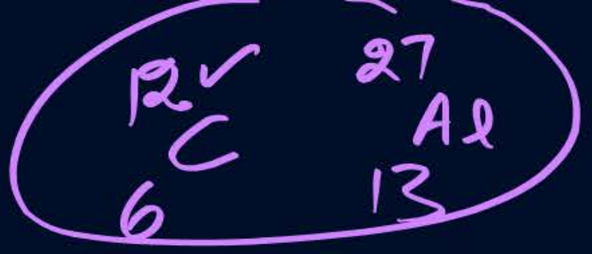
A.M.M. | no. of molecules

44u | $\frac{132}{44} = 3$

64u | $\frac{128}{64} = 2$

17u | $\frac{85}{17} = 5$

Question



Statement-I: Both 12g of carbon and 27 g of aluminium will have 6.02×10^{23} atoms.

Statement-II: Gram atomic mass of an element contains Avogadro's number of atoms

A. Statement-I is true, Statement-II is true; Statement-II is correct explanation for Statement-I.

B. Statement-I is true, Statement-II is true; Statement-II is not a correct explanation for Statement-I.

C. Statement-I is true, Statement-II is false

D. Statement-I is false, Statement-II is true

Question (NCERT: PL-16 | JEE Main April 4, 2024 (II))

Choose the Incorrect Statement about Dalton's Atomic Theory

$C + 2O \rightarrow CO_2$

O_2

(A) Compound are formed when atoms of different elements combine in any ratio

(B) All the atoms of a given element have identical properties including identical mass

(C) Matter consists of indivisible atoms

(D) Chemical reactions involve reorganization of atoms

Question (NCERT: PL-18 | JEE Main April 10, 2023 (I))

The number of molecules are moles in 2.8375 litres of O_2 at STP are respectively

(A) 7.527×10^{22} and 0.250 mol ✗

(B) 1.505×10^{23} and 0.250 mol ✗

(C) 7.527×10^{23} and 0.125 mol

(D) 7.527×10^{22} and 0.125 mol ✓

$n = \frac{2.8375}{22.4} = 0.125 \text{ mol}$

$\text{molecules} = \frac{0.125}{1000} \times 6.02 \times 10^{23}$

$\approx \frac{6}{8} \times 10^{23} = \frac{0.75 \times 10^{23}}{10} \times 10$

$= 7.5 \times 10^{22}$

Question (NCERT: PL-18 | JEE Main April 10, 2023 (II))

^{14}N G.M.M $SO_3 = 64g$

Match List I with List II:

	List – I		List – II
A.	16g of $CH_4(g)$	I.	Weighs 28 g
B.	1 g of $H_2(g)$	II.	60.2×10^{23} electrons
C.	1 mole of $N_2(g)$	III.	Weighs 32 g
D.	0.5 mol of $SO_2(g)$	IV.	Occupies 11.4 L volume at STP

$n_{H_2} = \frac{1}{2} = 0.5$

Vol at $H_2(g)$ at STP

$= 0.5 \times 22.7$ L

$= 11.35$ L

Choose the correct answer from the options given below :

(A) A-I, B-III, C-II, D-IV

(B) A-II, B-III, C-IV, D-I

(C) A-II, B-IV, C-III, D-I

(D) A-II, B-IV, C-I, D-III

Question (NCERT: PL-16 | JEE Main Jan. 07, 2020 (I)

Amongst the following statements, that which was not proposed by Dalton was :

(A) Chemical reactions involve reorganization of atoms. These are neither created nor destroyed in a chemical reaction.

(B) All the atomso f a given element have identical properties including identical mass. Atoms of different elements differ in mass.

(C) When gases combine or reproduced in a chemical reaction they do so in a simple ratio by volume, provided all gases are at the same T and P.

(D) Matter consists of indivisible atoms.

Which of the following pairs are isotopes?

(A) $^{12}_{6}C$ and $^{14}_{6}C$

(B) $^{20}_{10}Ne$ and $^{20}_{6}Na$

(C) $^{35}_{17}Cl$ and $^{37}_{18}Ar$

(D) $^{14}_{6}C$ and $^{14}_{7}N$

Which pair of species are isobars?

(A) $^{40}_{20}Ca$ and $^{40}_{18}Ar$

(B) $^{12}_{6}C$ and $^{16}_{7}C$

(C) $^{16}_{8}O$ and $^{22}_{12}Ng$

(D) $^{22}_{11}Na$ and $^{24}_{12}Mg$

Which pair are isotones?

(A) $^{14}_{6}C$ and $^{15}_{7}N$

(B) $^{16}_{8}O$ and $^{17}_{9}F$

(C) $^{35}_{11}Cl$ and $^{37}_{12}Cl$

Which of the following pairs are isoelectronic

(A) Na^{+} and Ne 10 e⁻

(B) Cl^{-} and Ar

(C) O^{2-} and F^{-}

Question

For the following isotopes of Mg, abundance is given.

I.	$^{26}_{12}Mg$	14	0.15
II.	$^{25}_{12}Mg$	13	0.05
III.	$^{24}_{12}Mg$	12	0.80

Which has highest number of neutrons in 24.35 g of mixture of isotopes?

(A) I

(B) II

(C) III

(D) equal

An unknown element X has three otopes: X-100, X-101, and X-102," ne mass of X-100 is 100 u, and X-102 102 u. If the average atomic mass 101.2 u and the abundances of X-100 and X-102 are equal, find ne abundance (%) of X-101.

A) 20%
B) 40%
C) 60%

2. An element Z exists in two isots forms Z-79 and Z-81. Its average atomic mass is 79.9 u. If the atomi mass of Z-81 is slightly uncertain (between 80.9 u and 81.1 u), which range of % abundance is certainly possible for Z-79?

(A) 50–55% (B) 70–75%
(C) 85–90% (D) Cannot be determine without exact

$$\text{av. at. mass } Z = 79.9 = \frac{79x + (100-x)81}{100}$$

$$7990 = 79x + 8100 - 81x$$

$$7990 - 8100 = -2x$$

$$+110 = +2x$$

$$x = 55\%$$

Two isotopes of an element A re accidentally mixed in a laboratory in a 2:3 molar ratio. Their atomic masses are 10 u and 12 u respectively. What is the experimentally observed atomic mass of the mixture?

A) 11.0 u (B) 11.2 u
C) 11.3 u (D) 11.5 u

$x = 10\,u$ & $12\,u$

$2 : 3$

% age of $x = \frac{2}{5} \times 100 = 40\%$

$y = 60\%$

av. at. mass $= \frac{40 \times 10 + 60 \times 12}{100} = \frac{400 + 720}{100} = \frac{1120}{100} = 11.2$

4. In a sample of element M, the isotope M-64 is found to undergo radioactive decay over time. Initial M-64 had 60% abundance and M-66 had 40%. After decay, M-64 abundance drops to 30%. Assuming masses stay contant, ho does the average atomic mass of the element change?

(A) Increases (B) Decrease
(C) Remains same (D) First decre

M-64 → radioactive decay

M-64 → 60%

M-66 → 40%

av. at. mass initial $= \frac{60 \times 64 + 40 \times 66}{100} = \frac{3840 + 2640}{100} = 64.80$

M-64 ↓ 30%

M-66 ↓ 70%

384
264
648

$$\text{new av. at. mass} = \frac{30 \times 64 + 70 \times 66}{100}$$

$$= \frac{1920 + 4620}{100} = 65.4$$

462
192
654

THANK YOU