PHYSICAL CHEMISTRY

DPP

DAILY PRACTICE PROBLEMS

DPP No. 2

Total Marks : 33

Max. Time : 33 min.

Topic : Mole Concept

Type of Questions **M.M., Min.**

Single choice Objective ('–1' negative marking) Q.1 to Q.11 **(3 marks, 3 min.)** **[33, 33]**

1. The mass of half mole of electrons is about : (Given : Mass of electron = 9.109×10^{-28} g)
(A) 0.548 mg (B) 0.274 mg (C) 1.096 mg (D) 9.109 mg

2. 39.4 kg of gold was recovered from a smuggler. The number of atoms of gold recovered are :
(A) 200 (B) 1.2044×10^{25} (C) 6.022×10^{25} (D) 1.2044×10^{26}

3. The mass of Magnesium that contains the same number of atoms as are present in 2g of Calcium is :
(A) 1.2 g (B) 2.4 g (C) 0.6 g (D) 1.8 g

4. The number of gram-atoms present in 288g of sulphur is :
(A) 18 (B) 9 (C) 4.5 (D) 13.5

5. 1.5×10^{22} atoms of an element weigh 0.9 g. The atomic mass of the element (in amu) is :
(A) 36 (B) 18 (C) 54 (D) 72

6. The ratio of mass of a Titanium atom to the mass of a Carbon atom is 4 : 1. Then, the molar mass of Titanium is :
(A) 3 g (B) 48 g (C) 12 g (D) 24 g

7. A hypothetical element Z exists in nature as two isotopes Z^{65} and Z^{67} with their relative abundances 25% and 75% respectively. Then, the average atomic mass (in u) of element Z is :
(A) 65.5 (B) 66 (C) 66.25 (D) 66.5

8. The mass of a molecule of water is :
(A) 3×10^{-26} kg (B) 3×10^{-25} kg (C) 1.5×10^{-26} kg (D) 2.5×10^{-26} kg

9. The weight of 1×10^{22} molecules of $MgSO_4.7H_2O$ is :
(A) 4.1 g (B) 41 g (C) 410 g (D) 0.41 g

10. Among the following samples, the largest number of molecules is in :
(A) 28 g of CO (B) 46 g of C_2H_5OH (C) 36 g of H_2O (D) 54 g of N_2O_5

11. 124 g of P_4 will contain which of the following :

(1) 4 atoms of Phosphorus (2) $4N_A$ atoms of Phosphorus

(3) N_A molecules of Phosphorus (4) 1 molecule of Phosphorus

(A) 1 and 4 (B) 2 and 3 (C) 1 and 3 (D) 2 and 4

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Answer Key

DPP No. # 2

1.	(B)	**2.**	(D)	**3.**	(A)	**4.**	(B)	**5.**	(A)
6.	(B)	**7.**	(D)	**8.**	(A)	**9.**	(A)	**10.**	(C)
11.	(B)								

Hints & Solutions

DPP No. # 2

2. No. of atoms of gold recovered = Moles of gold $\times N_A$

$$= \left(\frac{39.4\times10^3}{197}\right)\times N_A$$

$$= 1.2044 \times 10^{26}$$

5. Mole of element $\times$ At. Mass of element = Mass of element

$$\left(\frac{1.5\times10^{22}}{N_A}\right) \times \text{At. Mass of element} = 0.9$$

$\therefore$ At. Mass of element = 36 u.

8. 6×10^{23} molecules has mass = 18gm

1 molecules has mass = $\frac{18}{6\times10^{23}} = 3 \times 10^{-23}$ gm

$= 3 \times 10^{-26}$ kg.

10. (A) No. of molecules = $\frac{28}{28} \times N_A = N_A$ (B) No. of molecules = $\frac{46}{46} \times N_A = N_A$

(C) No. of molecules = $\frac{36}{18} \times N_A = 2N_A$ (max) (D) No. of molecules = $\frac{54}{108} \times N_A = 0.5N_A$

11. Molecular mass of $P_4 = 4 \times 31 = 124$ amu
$\therefore$ 124 g of P_4 contains 1 mole of $P_4 = N_A$ molecules of Phosphorus.
1 mole of P_4 contains $4N_A$ atoms of P.

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