

Some Basic Concepts of Chemistry JEE Main PYQ - 1

Total Time: 25 Minute

Total Marks: 40

Instructions

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1. Test will auto submit when the Time is up.
2. The Test comprises of multiple choice questions (MCQ) with one or more correct answers.
3. The clock in the top right corner will display the remaining time available for you to complete the examination.

Navigating & Answering a Question

1. The answer will be saved automatically upon clicking on an option amongst the given choices of answer.
2. To deselect your chosen answer, click on the clear response button.
3. The marking scheme will be displayed for each question on the top right corner of the test window.

Some Basic Concepts of Chemistry

1. Dissolving 120 g of a compound of (mol. wt. 60) in 1000 g of water gave a solution of density 1.12 g/mL. The molarity of the solution is : (+4, -1)
[9-April-2014-Online]
- 1.00 M
 - 2.00 M
 - 2.50 M
 - 4.00 M
-
2. The amount of oxygen in 3.6 moles of water is : (+4, -1)
[9-April-2014-Online]
- 115.2 g
 - 57.6 g
 - 28.8 g
 - 18.4 g
-
3. The density of 3M solution of sodium chloride is 1.252 g mL⁻¹. The molality of the solution will be: (molar mass, NaCl = 58.5 g mol⁻¹) (+4, -1)
[22-April-2013-Online]
- 260 m
 - 2.18 m
 - 2.79 m
 - 3.00 m
-
4. Number of atoms in the following samples of substances is largest in : (+4, -1)
[23-April-2013-Online]
- 4.0 g of hydrogen
 - 71.0 g of chlorine

- c. 127.0 g of iodine
- d. 48.0 g of magnesium

5. 10 mL of 2(M) NaOH solution is added to 200 mL of 0.5(M) of NaOH solution. (+4, -1)
What is the final concentration? [25-April-2013-Online]

- a. 0.57 (M)
- b. 5.7 (M)
- c. 11.4 (M)
- d. 1.14 (M)

6. 6 litres of an alkene require 27 litres of oxygen at constant temperature and (+4, -1)
pressure for complete combustion. The alkene is: [25-April-2013-Online]

- a. Ethene
- b. Propene
- c. 1-Butene
- d. 2-Butene

7. Choose the incorrect formula out of the four compounds for an element X (+4, -1)
below: [11-April-2015-Online]

- a. X_2Cl_3
- b. X_2O_3
- c. $X_2(SO_4)_3$
- d. XPO_4

8. The amount of $BaSO_4$ formed upon mixing 100 mL of 20.8% $BaCl_2$ solution with (+4, -1)
50 mL of 9.8% H_2SO_4 solution will be : ($Ba = 137, Cl = 35.5, S = 32, H = 1$ and $O =$

16)

- a. 23.3 g
- b. 11.65 g
- c. 30.6 g
- d. 33.2 g

9. A sample of a metal oxide has formula $M_{0.83}O_{1.00}$. The metal M can exist in two oxidation states +2 and +3. In the sample of $M_{0.83}O_{1.00}$, the percentage of metal ions existing in +2 oxidation state is ___% (nearest integer) (+4, -1)

10. How many moles of $Ba_3(PO_4)_2$ will be formed by the reaction of 5 moles of $BaCl_2$ and 3 moles of $Na_3(PO_4)$. (+4, -1)



Answers

1. Answer: b

Explanation:

$$\begin{aligned}\text{Molarity of solution} &= \frac{\left(\frac{120}{60}\right)}{\frac{1120}{1.12} \times \frac{1}{100}} \\ &= 2 M\end{aligned}$$

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2. Answer: b

Explanation:

$$\begin{aligned}3.6 \text{ moles of } H_2O &= 3.6 \text{ moles of } O \\ &= 3.6 \times 16 \text{ gm of oxygen} \\ &= 57.6 \text{ gm}\end{aligned}$$

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3. Answer: c

Explanation:

The relation between molarity (M) and molality (m) is

$$d = M \left(\frac{1}{m} + \frac{M_2}{1000} \right), M_2 = \text{Mol. mass of solute}$$

On putting value

$$1.252 = 3 \left(\frac{1}{m} + \frac{58.5}{1000} \right)$$

on solving $m = 2.79$

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Explanation:

$4g$ of hydrogen = 4 mole of hydrogen
= $4 \times 6.023 \times 10^{23}$ atoms
 71.0 gm of chlorine $\frac{71.0}{71.0} = 1 =$ moles of chlorine
= 6.023×10^{23} atoms
 127 gm of iodine = $\frac{1}{2}$ mole of I_2
= $\frac{127}{254} = 6.023 \times 10^{23} \times \frac{1}{2}$ atoms
 $48.$, gm of magnesium
= $\frac{48.0}{24.0} = 2 \times 6.023 \times 10^{23}$ atoms
 $\therefore 4.0$ gm H_2 has largest number of atoms.

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5. Answer: a

Explanation:

From molarity equation

$$M_1V_1 + M_2V_2 = MV_{(total)}$$

$$2 \times \frac{10}{1000} + 0.5 \times \frac{200}{1000} = M \times \frac{210}{1000}$$

$$120 = M \times 210$$

$$M = \frac{120}{210} = 0.57M$$

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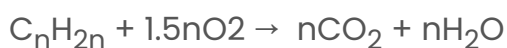
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6. Answer: b

Explanation:



$$6 \times 1.5n = 27$$

$$n = 3$$

So, the correct answer is (B) : Propene

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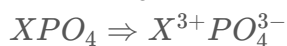
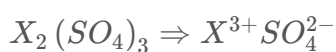
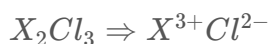
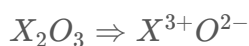
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7. Answer: a

Explanation:



Because Cl^{2-} does not exist. So, X_2Cl_3 is incorrect. The correct formula should be XCl_3 .

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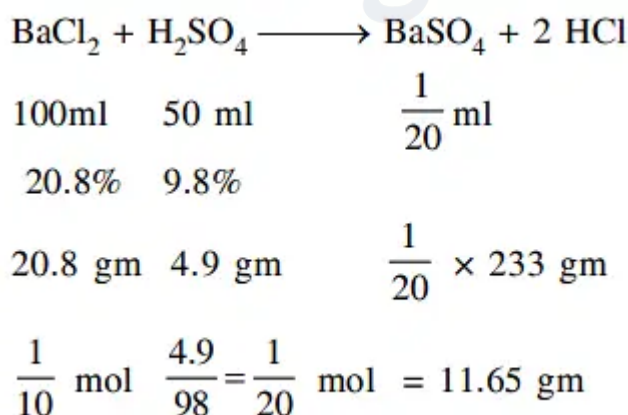
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8. Answer: b

Explanation:

The correct option is(B): 11.65 g.



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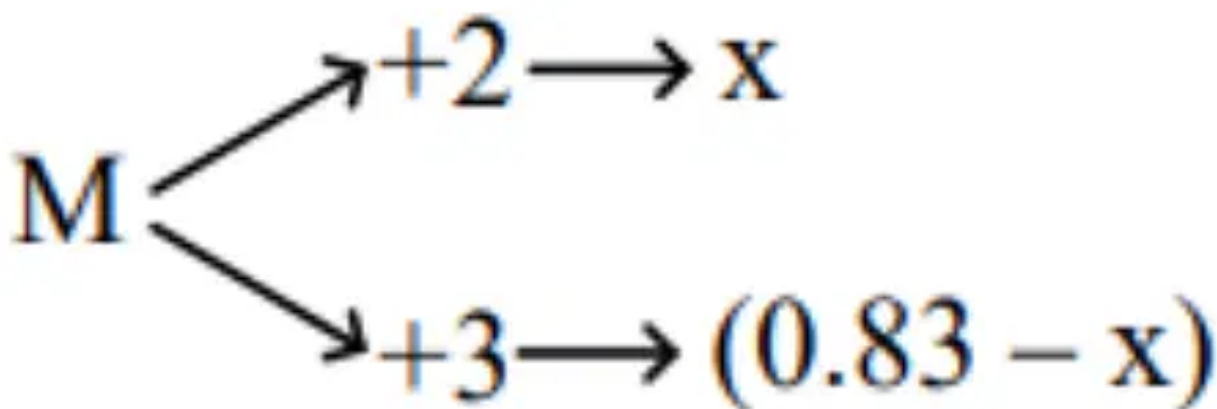
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9. Answer: 59 – 59

Explanation:



$$2x + 3(0.83 - x) = 2$$

$$x = 0.49$$

$$\%M^{2+} = 0.83 \times 0.49 \times 100$$

$$= 59\%$$

So, the correct answer is 59.

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10. Answer: 53 – 53

Explanation:



5 mole 3 mole

Moles of $Ba_3(PO_4)_2 = \frac{5}{3}$

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