Some Basic Concepts of Chemistry

Question 1.
Formula of Ferric Sulphate is:
(a) $FeSo_4$
(b) $Fe\ (So_4)_3$
(c) $Fe_2\ (So_4)_3$
(d) Fe_2So_4

▼ Answer

Answer: (c) $Fe_2\ (So_4)_3$
Explanation:
Iron (III) sulfate (or ferric sulfate), is the chemical compound with the formula $Fe_2(SO_4)_3$. Usually yellow, it is a salt and soluble in water.

Question 2.
Approximate atomic weight of an element is 26.89. If its equivalent weight is 8.9, the exact atomic weight of element would be
(a) 26.89
(b) 8.9
(c) 17.8
(d) 26.7

▼ Answer

Answer: (a) 26.89
Explanation:
Atomic weight = (Equivalent weight × Valency)
= (8.9 × 3) = 26.7
(Valency = (26.89)/(8.9) ≈ 3).

Question 3.
The total number of atoms represented by the compound $CuSO_4.\ 5H_2O$ is
(a) 27
(b) 21
(c) 5
(d) 8

▼ Answer

Answer: (b) 21
Explanation:
21 atoms are present in the compound $CuSO_4.\ 5H_2O$.

Question 4.
An atom is 10 times heavier than 1/12th of mass of a carbon atom (C – 12). The mass of the atom in a.m.u. is
(a) 10
(b) 120
(c) 1.2
(d) 12

▼ Answer

Answer: (a) 10
Explanation:
(1/2)th if mass of carbon atom weighs exact as 1 gm as from (1 × 12)/ (12) = 1 amu.
Therefore 10 times of this would be = (10 × 1) = 10 gms.
Hence 10 g would be the molar mass of that atom.

Question 5.
81.4 g sample of ethyl alcohol contains 0.002 g of water. The amount of pure ethyl alcohol to the proper number of significant figures is
(a) 81.398 g
(b) 71.40 g
(c) 91.4 g
(d) 81 g

▼ Answer

Answer: (a) 81.398 g
Explanation:
Pure ethyl alcohol
= (81.4 − 0.002)
=81.398.

Question 6.
Which of the following halogen can be purified by sublimation
(a) F_2
(b) Cl_2
(c) Br_2
(d) I_2

▼ Answer

Answer: (d) I_2
Explanation:
Sublimation is going directly from the solid to vapor state without passing through the liquid state. The classic demonstration of sublimation is iodine crystals. Heat them at one end of a sealed tube with the other end cooled. We get a beautiful violet vapor and can watch the iodine crystals form from the vapor in the cool end. Let us Wait for some time and all the solid iodine will disappear in the hot end and reappear as beautiful black crystals in the cold end.

Question 7.
1 mol of CH_4 contains
(a) 6.02×10^{23} atoms of H
(b) 4 g atom of Hydrogen
(c) 1.81×10^{23} molecules of CH_4
(d) 3.0 g of carbon

▼ Answer

Answer: (b) 4 g atom of Hydrogen
Explanation:
1 mole of CH_4 contains 4 mole of hydrogen atom i.e. 4g atom of hydrogen.

Question 8.
The prefix zepto stands for
(a) 10^9

(b) 10^{-12}
(c) 10^{-15}
(d) 10^{-21}

▼ Answer

Answer: (d) 10^{-21}
Explanation:
1 zepto $=10^{-21}$

Question 9.
Which has maximum number of atoms?
(a) 24 g of C (12)
(b) 56 g of Fe (56)
(c) 27 gof Al (27)
(d) 108 g of Ag (108)

▼ Answer

Answer: (a) 24 g of C (12)
Explanation:
Number of atoms = (number of moles × Avogadros number (N A))
⇒ Number of atoms in 24 g C
= (24/12) × N A= 2N A
Number of atoms in 56 g of Fe
= (56/56) N A = N A Number of atoms in 27 g of A1
= (27/27) N A = N A Number of atoms in 108 g of Ag
= (108/108)N A = N A
Hence, 24 g of carbon has the maximum number of atoms.

Question 10:
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
(a) Conservation of Mass
(b) Multiple Proportions
(c) Constant Composition
(d) Constant Volume

▼ Answer

Answer: (c) Constant Composition
Explanation:
The H : O ratios in water is fixed, irrespective of its source. Hence it is law of constant composition

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Question 11.
Haemoglobin contains 0.33% of iron by weight. The molecular weight of haemoglobin is approximately 67200. The number of iron atoms (At. wt. of Fe = 56) present in one molecule of haemoglobin is
(a) 6
(b) 1
(c) 4
(d) 2

▼ Answer

Answer: (c) 4
Explanation:

Because 100 gm Hb contains = 0.33 gm Fe
Therefore, 67200 gm Hb = (67200 × 0.33)/ (100 gm)
Fe gm atom of Fe = (672 × 0.33)/(56)
= 4.

Question 12.
The -ve charged particles is called :
(a) Anion
(b) Cation
(c) Radical
(d) Atom

▼ Answer

Answer: (a) Anion
Explanation:
A charged particle, also called an ion, is an atom with a positive or negative charge.
This happens whenever something called an ionic bond forms.
Two particles that have different numbers of electrons (the smallest particle in an atom which is negative) start reacting to each other.
The particle that has the greater amount of electrons takes the other particles electrons.
One becomes positive because it lost an electron, and the other negative because it got another electron.
The two particles become attracted to each other and mix together, making a new kind of particle.

Question 13.
Which of the following contains same number of carbon atoms as are in 6.0 g of carbon (C – 12) ?
(a) 6.0 g Ethane
(b) 8.0 g Methane
(c) 21.0 g Propane
(d) 28.0 g CO

▼ Answer

Answer: (b) 8.0 g Methane
Explanation:
6 g carbon
Moles of carbon = (6/12) = 0.5 mol
Number of carbon atoms
= 0.5 × N_A =0.5N_A (N_A is Avogadro number)
6 g ethane (C_2H_6 two atoms of C per mole)
Moles = (6/30) = 0.2 mol
Number of carbon atoms = 0.2 × 2 × N_A = 0.4 N_A
(Number of carbon atoms = moles of compound X number of C atoms per mol × Avogadro number)
8 g methane (CH_4)
Moles = (8/16) = 0.5 mol
Number of carbon atoms = 0.5 × 1 × N_A = 0.5 N_A
21 g propane (C_3H_8)
Moles = (21/44) =0.48 mol
Number of carbon atoms = 0.48 × 3 × N_A = 1.44 N_A
28 g CO
Moles = (28/28) =1 mol
Number of carbon atoms = 1 × 1 × N_A = N_A

Question 14.
The density of a gas is 1.78 gL^{-1} at STP. The weight of one mole of gas is
(a) 39.9 g
(b) 22.4 g
(c) 3.56 g
(d) 29 g

▼ Answer

Answer: (a) 39.9 g
Explanation:
Molar gas volume at STP is:
1 mole = 22400 cm^3 = 22.4 litres
Density = (mass / volume)
Density = 1.78 g/litre
Volume = 22.4 litres
Mass = (volume × density)
(1.78 × 22.4) = 39.872 g

Question 15.
Molarity of 0.2 N H_2SO_4 is
(a) 0.2
(b) 0.4
(c) 0.6
(d) 0.1

▼ Answer

Answer: (d) 0.1
Explanation:
Molarity = (number of moles of solute / volume of solution in litres)
Here number of moles = (given mass of solute / molar mass)
whereas Normality = (Number of gram equivalent / volume of solution in liter)
where gram equivalent = (mass of solute / equivalent mass)
Consider an example of H_2SO_4 whose molar mass = 98 g per mole
Consider a Solution containing 0.98 g of sulphuric acid in 100 ml.
Volume = 100 ml = 0.1 l
Then,
Number of moles = (0.98 / 98)
Number of moles = 0.01
Hence molarity = (0.01 / 0.1) = 0.1 M
Hence Molarity = 0.1 M
Now sulphuric acid is dibasic therefore
Its equivalent weight = (98 / 2)
Hence equivalent weight = 49
So the gram equivalent = (0.98 / 49) = 0.02
Now Normality = (0.02 / 0.1)
Hence the Normality is equal to 0.2 N.
Thus for H_2SO_4 (i.e. dibasic) Normality is 0.2 N and molarity is 0.1 M.

Question 16.
Any charged particle is called:
(a) Atom
(b) Molecule
(c) Ion
(d) Mixture

▼ Answer

Answer: (c) Ion
Explanation:
A charged particle, also called an ion, is an atom with a positive or negative charge.This happens whenever something called an ionic bond forms. Two particles that have different numbers of electrons (the smallest particle in an atom which is negative) start reacting to each other. The particle that has the greater amount of electrons steals the other particles electrons. One becomes positive because it lost an electron, and the other negative because it got another electron. The two particles become attracted to each other and mix together, making a new kind of particle.

Question 17.
The balancing of equations is based upon which of the following law?
(a) Law of Multiple Proportions
(b) Law of Conservation of Mass
(c) Boyles Law
(d) Law of Reciprocal Proportions

▼ Answer

Answer: (b) Law of Conservation of Mass
Explanation:
Balanced chemical equation: A chemical equation in which the number of atoms of reactants and the number of atoms of products is equal is called a balanced equation. Every chemical equation should be balanced because:
i) According to the law of conservation of mass, atoms are neither created not destroyed in chemical reactions.
ii) It means the total mass of the products formed in a chemical reaction must be equal to the mass of reactants consumed.

Question 18.
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
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Question 19.
A chemical formula based on actual number of molecule is called _____ formula:
(a) Structural
(b) Molecular
(c) Empirical
(d) None

▼ Answer

Answer: (b) Molecular
Explanation:
Molecular formulas indicate the simple numbers of each type of atom in a molecule, with no information on structure. For example, the empirical formula for glucose is CH_2O (twice as many

hydrogen atoms as carbon and oxygen), while its molecular formula is $C_6H_{12}O_6$ (12 hydrogen atoms, six carbon and oxygen atoms).

Question 20.
Approximate atomic weight of an element is 26.89. If its equivalent weight is 8.9, the exact atomic weight of element would be
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(d) 26.7

▼ Answer

Answer: (d) 26.7
Explanation:
Atomic weight = (Equivalent weight × Valency)
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