

A student analysed a chloride XCl_4 where X is a metal. He found that 25.0 g of the compound contains 0.527 mol of Cl.

- Q.1** What is the approximate GMM of XCl_4 :
 (A) 190 g (B) 220 g
 (C) 95 g (D) None of these
- Q.2** What is the metal 'X' :
 (A) Hg [At mass : 200.5]
 (B) Tc [At mass : 48]
 (C) Al [At. mass : 27]
 (D) Mg [At. Mass : 24]
- Q.3** If student takes 0.5 mol of X_2SO_4 what mass of X_2SO_4 he weighs :
 (A) 96 g (B) 198 g
 (C) 192 g (D) None of these

A chemist decided to determine the molecular formula of an unknown compound. He collects following informations :

- (I) Compound contains 2 : 1 'H' to 'O' atoms.
 (II) Compound has 40% C by mass.
 (III) Approximate molecular mass as 178 g.
 (IV) Compound is a carbohydrate.

- Q.4** What is the combined % by mass of hydrogen and oxygen-
 (A) 40% (B) 60%
 (C) 20% (D) None of these
- Q.5** What is the empirical formula of the compound-
 (A) CH_3O (B) CH_2O
 (C) C_2H_2O (D) CH_3O_2
- Q.6** Which of the following could be molecular formula of compound-
 (A) $C_6H_6O_6$ (B) $C_6H_{12}O_6$
 (C) $C_6H_{18}O_{12}$ (D) $C_6H_{18}O_6$

FOLLOWING QUESTION ARE NOT BASED ON ANY PARAGRAPH :

- Q.7** Pyrite, an impurity in some coals, reacts with oxygen to form the air pollutant sulfur dioxide. When 2.0×10^4 kg of coal containing 0.050 mass percent pyrite is burned, what mass of sulfur dioxide will form ?
 $2FeS_2(s) + 5O_2(g) \rightarrow 4SO_2(g) + 2FeO(s)$
 (A) 11g (B) 1.1×10^4 g
 (C) 1.1×10^6 g (D) 2.1×10^7 g

- Q.8** The average mass of a carbon atom is 12.011. If you were able to select a single carbon atom randomly from a naturally occurring sample, the chances that you would select one with a mass of 12.011 is-
 (A) 0% (B) 0.011%
 (C) About 12% (D) 12.011%

- Q.9** Iron is important in the transport of oxygen from the lungs to the organs of the body by red blood cells. In the blood of an adult human, there are approximately 2.60×10^{13} red blood cells that contain a total of 2.90 g of iron. On average, how many iron atoms does each red blood cell contain ?
 (A) 8.33×10^{-10} (B) 1.20×10^9
 (C) 3.12×10^{22} (D) 2.60×10^{13}

- Q.10** Hydrazine, N_2H_4 , is a base like ammonia that reacts with acids such as sulfuric acid
 $2N_2H_4(aq) + H_2SO_4(aq) \rightarrow 2N_2H_5^+ + SO_4^{2-}$
 The mass of hydrazine required to react with 250 mL of 0.225 M H_2SO_4 is-
 (A) 0.900 g (B) 1.80 g
 (C) 3.60 g (D) 14.4 g

- Q.11** A compound prepared as a model of hemoglobin is 4.6% iron by mass. If the compound is known to contain a single iron atom, which of these values will be closest to its molar mass ?
 (A) 1000 g mol⁻¹ (B) 1200 g mol⁻¹
 (C) 1400 g mol⁻¹ (D) 1600 g mol⁻¹

- Q.12** Sodium nitrate, heated in the presence of an excess of hydrogen, forms water according to the two-step process
 $2NaNO_3 \rightarrow 2NaNO_2 + O_2$
 $2H_2 + O_2 \rightarrow 2H_2O$
 How many grams of sodium nitrate are required to form 9.0 grams of water ?
 (A) 21.3 (B) 42.5
 (C) 69.0 (D) 85.0

- Q.13** Magnetite, Fe_3O_4 , can be converted into metallic iron by heating with carbon monoxide as represented by this equation
 $Fe_3O_4(s) + 4CO(g) \rightarrow 3Fe(s) + 4CO_2(g)$
 How many kilograms of Fe_3O_4 must be processed in this way to obtain 5.00 kg of iron if the process is 85% efficient ?
 (A) 6.92 kg (B) 8.15 kg
 (C) 20.8 kg (D) 24.4 kg

CHEMISTRY IIT JEE (CLASS TEST - 5) (PHYSICAL) ANSWER KEY

Name : Roll No. :

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