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| **PT1/CHAK/1119A 19/05/2019** | | | | | |
| **PERIODIC TEST -I (2019-20)** | | | | | |
| **Subject: CHEMISTRY**  **Grade: XI** | | Max. Marks: 30Time: 1Hr. 10 mins | | | |
| **Name:** | | | **Section:** | **Roll No:** | |
|  | **SECTION - A** | | | |  |
|  | 3.4 = (32 / x) × 100  3.4  x = 32 × 100  x   = 941.176 g.  Minimum molecular weight of insulin: 941.176 g | | | | 1 |
|  | The energy of the electron present at infinity from the nucleus is taken as zero. As the electron moves towards the nucleus, it experiences a force of attraction by the nucleus. As a result, some energy is given out. Since its value was already zero hence now it becomes negative. | | | | 1 |
|  | (a)12.044 x 1020 molecules | | | | 1 |
|  | Mass of one mole of C12 = 12 g.  so mass of 1 atom of C12 = 1.9927 x 10-23 g | | | | 1 |
|  | According to Bohr postulate of angular momentum,  mvr = nh/2π ⇒ 2πr = nh/mv …(i**)** ½ mark  According to de Broglie equation, λ=h/mv …(ii)  Substituting the value of eqn (ii) in eqn (i) we get,  2πr = nλ …….1/2 mark | | | | 1 |
|  | **SECTION-B** | | | |  |
|  | 1. No of moles = 75 x 0.60/1000 = 0.045 mol 2. M1V1= M2V2   0.60 x .075 = M2 x 2  M2 = 0.0225 M | | | | 1  ½  ½ |
|  | The radius of the Bohr`s orbit by = A0  n=1 , Z = 3  radius = 0.529 x 9 = 4.761 A0 | | | | ½  ½  ½  ½ |
|  |  | | | |  |
|  | |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Element** | **% of element** | **At. mass of element** | **Moles of element** | **Simplest molar ratio** | **Simplest whole no. ratio** | | C | 40.687 | 12 | 3.390 | 1 | 2 | | H | 5.085 | 1 | 5.085 | 1.5 | 3 | | O | 54.228 | 16 | 3.389 | 1 | 2 |   Empirical formula is C2H3O2  empirical formula mass = 59  Molecular mass = 118  n = 118/59 = 2 ; molecular formula is C4H6O4 | | | | 1  1 |
|  | 1. Isoelectronic species: Ions which contain the same number of electrons but different nuclear charge. Eg. O2–, F–, Na+ and Mg2+ (any correct pair) 2. N3– > O2– > F– > Na+ > Mg2+ > Al3 | | | | ½+ ½  1 |
|  | **SECTION-C** | | | |  |
|  | a) Definition Heisenberg Uncertainty principle  b) accuracy in velocity is 0.005%, uncertainty in velocity, Δv = 600 x 0.005 / 100 = 3 x 10-2 m s-1  Uncertainty in position will be: | | | | 1  ½  ½  1 |
|  | a) Balmer series  b) for the Balmer series,longest wavelength transition,  *ni* = 2 to *nf* = 3  ṽ= 1.5236 × 106 m–1 | | | | 1  ½  ½  ½  ½ |
|  | **In the first oxide :** weight of copper = 0.888g  Weight of oxygen = 1 – 0.888 =0.112g  0.888g of copper combined with oxygen = 0.112g  Then 1g of copper combined with oxygen = 0.112/0.888 = 0.126g  **In second oxide :** weight of copper = 0.798g  Weight of oxygen = 1 – 0.798 = 0.202g  0.798g of copper combined with oxygen = 0.202g  Then 1g of copper combined with oxygen = 0.202/0.798 = 0.253g  Ratio by weight of oxygen which combine with 1g of copper in the two oxide is  0.126 : 0.253 = 1 : 2 , As the ratio is simple whole number in nature , the Law of Multiple proportions is proved | | | | ½  ½  1 |
|  | Molar mass of NaCl =23 + 35.5=58.5g Molar mass of AgNO3=108 +14 +3×16 =170g  Molar mass of AgCl=108 + 35.5 =143.5g  Moles of NaCl = 14.625/58.5 = 0.25  Moles of AgNO3=85/170 = 0.5 mol  The reaction is NaCl + AgNO3 ----🡪 AgCl + NaNO3  Ie. 1 mol NaCl reacts with 1 mol AgNO3 giving 1 mol AgCl  NaCl is the limiting reagent  0.25 mol NaCl gives 0.25 mol AgCl  Mass of AgCl produced = 0.25 x 143.5= 35.875g | | | | ½  ½  ½  ½  1 |
|  | **SECTION-D** | | | |  |
| 14. | a) no, because in molality everything is in mass and mass not affect by temperature  b) 0.50 M Na2CO3 means 0.50 moles of Na2CO3 dissolve in 1000 ml solution  c) 1000 mL of 0.75 M HCl have 0.75 mol of HCl = 0.75×36.5 g = 24.375 g  ∴ Mass of HCl in 25mL of 0.75 M HCl = 24.375/1000 × 25 g = 0.6844 g  From the given chemical equation,  CaCO3 (s) + 2HCl (aq) → CaCl2(aq) + CO2 (g) + H2O(l)  2 mol of HCl i.e. 73 g HCl react completely with 1 mol of CaCO3 i.e. 100g  ∴ 0.6844 g HCl reacts completely with CaCO3 = 100/73 × 0.6844 g = 0.938 g | | | | 1  1  ½  1  ½  1 |
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