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Chemistry matters chapter 11 answers

No text content! Chemistry is important for the level of GCE 'O' (2nd edition): Complete solutions for textbook questions Chapter 12 Chapter 12 Salts Quick Check (page 214) (a) No. Copper is too inactive. He won't react with acid. (b) Yes. Hydrogen gas is given during a reaction. (c) No. Lead is too reactive. (d) No. Sodium is too reactive. He'll react explosively with acid. Test yourself 12.1 and 12.2 (pages 219-220) 1. (a) Zinc nitrate – water soluble (b) Water-soluble magnesium chloride (c) lead(II) sulfate – water-unsolvable (d) sodium sulfate – water soluble 2. A: dilute nitric acid b: water C: zinc (or dilute sulphuric acid) D: dilute sulphuric acid (or zinc) E: dilute hydrochloric acids F: carbon dioxide 3. Magnesium oxide response and sulphuric acid dilution (See Section Textbook 12.2, Method 1): • Dissolve excess solid magnesium oxide in diluted sulphuric acid. Magnesium sulfate is formed. It's soluble salt. • Filter the mixture and collect solum salt as a filtrate. Excess magnesium oxide is collected as a residue. • Heat the filtrate until it is sedate. • Cool the saturated solution. • Crystal collection filter. • Dry the crystals between the sheets of filter paper. 4. Reacting potassium hydroxide and diluting sulphuric acid (See Section Textbook 12.2, Method 2): • Pour diluted sulphuric acid into the burette. • Pipette 25 cm3 of potassium hydroxide solution into a conical flask. Add two drops of methyl orange. The solution turns yellow. • Slowly add diluted sulphuric acid from the burette until the solution turns red. • Record the volume of diluted sulphuric acid (V cm3) used. • Now pipette 25 cm3 potassium hydroxide into the new conical flask. • Add V cm3 diluted sulphuric acid to the potassium hydroxide solution, without the methyl orange indicator. • Carry out the crystallization process to obtain a clean, dry sample of potassium sulfate. © 2013 Marshall Cavendish International (Singapore) Private Limited 12.1Chemical Questions for GCE 'O' Level (2nd Edition): Complete Solutions to Textbook Issues Chapter 12 5. The method of initiation of salt of sodium carbonate precipitation solution and lead solution (II) nitrate lead solution (II) of carbonate solution and dilution of sulphuric acid titration ammonium sulfate dilute sulphuric acid and iron acid reaction with insolom metal iron(II) sulfate nitric acid and copper (II) acid reaction with non-void base copper oxide (II) nitrate litium hydroxide and dilute the titraction of hydrochloric acid lithium chloride Test Sami 12.3 (page 226) Cation : Zn2+ Anion : I– Get it Right (page 227) (a) False. All potassium, sodium, ammonium and nitrate salts are soluble in water. (b) Truth (c) True (d) True (s) False. Diluted nitric acid is added to the solution before testing for chloride or (f) True Let's Review Review Section A: Multiple-choice questions 1. D 2. C 3. B 4. B 5. 6. D 7. B section B: Structured issues 1. (a) X: sulphuric acid Y: sodium hydroxide solution or sodium carbonate solution Z: copper(II) oxide, copper (II) hydroxide or copper (II) carbonate (b) (i) Aqueous sodium hydroxide (ii) Heat (iii) It has a pungent odor and converts wet red litmus paper into blue. 2. Solution P: CuCl2, copper(II) chloride Solution Q: AgNO3, silver nitrate/ Pb(NO3)2, lead(II) nitrate Solution R: KCl, potassium chloride Gas S: CO2, carbon dioxide 3. (a) Add NaOH(aq) and heat: NH4Cl — gives ammonia, MgCl2 - no reaction. (b) Add excess NaOH(aq): Both provide white grout, but Zn(OH)2 is soluble in excess NaOH(aq). © 2013 Marshall Cavendish International (Singapore) Private Limited 12.2Chemical Issues for GCE 'O' Level (2. Release): Complete solutions to textbook questions Chapter 12 Section C: Free answer questions 1. (a) Reagents: barium chloride/ barium nitrate/ other solubable barium salts and potassium sulfate/ other soluminous sulphate salts/ sulphuric acid Barium chloride solution and potassium sulfate solution are mixed in the daper. Barium chloride and potassium sulfate react to give grout, barium sulfate. The mixture is then filtered. The collected residues are rinsed with distilled water and dried with filter paper. BaCl2(aq) + K2SO4(aq) → BaSO4(s) + 2KCl(aq) (b) BaCO3(s) + 2HCl(aq) → BaCl2(aq) + CO2(g) + H2O(l) (c) Bari sulfate is insoluble salt. Therefore, it does not disobey toxic barium ions when consumed. 2. (a) Junction K contains water. CNUH24++ (b) (i) K contains ions. (ii) K contains ions. (iii) K contains SO42-ions. 3. (a) A: iron(III) chloride B: iron (III) hydroxide C: silver chloride D: iron(III) chloride E: chloride (II) chloride (b) Silver sulfate solution © 2013 Marshall Cavendish International (Singapore) Private Limited 12.3 1. The solution can vary in composition, while the compound can not vary in composition. Solutions are homogeneous at the molecular level, while other mixtures are heterogeneous. 3. (a) The process is endothermic because the solution consumes heat. (b) The attraction between K+ and NO3–NO3– ions is stronger than between ions and water molecules (ion-ion-ion interactions have lower, more negative energy). Therefore, the thaw process increases the energy of molecular interactions, and consumes the heat energy of the solution to make this difference. (c) No, an ideal solution is formed without significant heat release or consumption. 5. (a) yono-dipole forces; (b) dipole-dipole forces; (c) dispersion forces; (d) dispersion forces; (e) hydrogen bonding 7. Heat is released when the total intermolecular forces (IMF) between the solute and solvent molecules are stronger than the total HFSS in pure solut and in a clean solvent: Breaking down weaker stronger IMF releases heat. Heat is absorbed when the total IMF in the solution is weaker than the total number of those in pure solut and in a clean solvent: Breaking down stronger PCs and forming weaker PCs absorbs heat. 9. NaCl crystals dissolve in water, polar fluid with a very large dikole moment, and individual ion become strongly solvated. Hexane is a non-polar liquid with a dipolar point of zero and therefore does not communicate significantly with ions of NaCl crystals. 11. (a) Fe(NO3)3 is a powerful electrolyte, so it should be completely deaf to Fe3+ and NO3–NO3– ions. Therefore (z) best represents the solution. (b) Fe(NO3)3(s)→Fe3+(aq)+3NO3–(aq)Fe(NO3)3(s)→Fe3+(aq)+3NO3–(aq)13. (a) high conductivity (solute is an ion compound that will go deaf when dissolved); (b) high conductivity (solute is a strong acid and will be fully ionized when dissolved); (c) non-compliant (solute is an extraolent compound, neither acid nor base, non-reactive to water); (d) low conductivity (solute is a weak base and will be partially ionized when dissolved) 15. (a) ion-dipole; (b) hydrogen bonds; (c) dispersion forces; (d) dipole-dipole attractions; (e) dispersion forces 17. The solubility of solids is usually reduced after cooling the solution, while the solubility of gases is usually reduced after heating. 27. The strength of the connection between molecules like is stronger than the power between molecules. Therefore, there will be some regions where water molecules will exclude oil molecules, and there will be other regions where oil molecules will exclude water molecules, formed by a heterogeneous region. 29. Both form homogeneous solutions; their increase in boiling points are the same, as well as their lowering of steam pressures. Osmotic pressure and lowering freezing points are also the same for both solutions. 31. (a) Find the number of moles HNO3 and H2O in 100 g of solution. Find mole fractions for components. (b) The HNO3 mole fraction is 0.378. Mole H2O is 0.622.33. (a) XNa2CO3=0.0119; XNa2CO3=0.0119; XH2O=0.988; XH2O=0.988; (b) XNH4NO3=0.0928; XNH4NO3=0.0928; XH2O=0.907; XH2O=0.907; (c) XCl2=0.192; XCl2=0.192; XCH2Cl2=0.808; XCH2Cl2=0.808; (d) XC5H9N=0.00426; XC5H9N=0.00426; XCHCl3=0.997XCHCl3=0.99735. In 1 M solution, the mole is located in exactly 1 L of solution. In a solution of 1 m, the mole is located in exactly 1 kg of solvent. 37. (a) Determine the molar mass of HNO3. Determine the number of moles of acid in the solution. According to the number of moles and the mass of solvents, determine molasses. (b) 33.7 m 39. (a) 6.70 ×× 10–1 m; (b) 5.67 m; (c) 2.8 m; (d) 0.0358 m 43. (a) Determine the molar mass of sucrose; determine the number of moles of sucrose in the solution; turn the solvent mass into units of kilograms; of the number of moles and the mass of solvents, molasses; determine the difference between the boiling point of water and the boiling point of the solution; determine a new boiling point. (b) 100.5 °C45. (a) Determine the molar mass of sucrose; determine the number of moles of sucrose in the solution; turn the solvent mass into units of kilograms; from the number of moles and the mass of solvents, determine molality; determine the difference between the freezing temperature of the water and the freezing temperature of the solution; determine the new freezing temperature. (b) –1.8 °C47. (a) Determine the molar mass Ca(NO3)2; determine the number of Ca(NO3)2 moles in the solution; determine the number of moles of ions in the solution; determine the molasses of the ion, and then the osmotic pressure. (b) 2,67 atm 49. (a) Determine the concentration of molates from the change in boiling point and KB; determine solut moles in a solution from molar concentration and solvent mass; determine the mass of molars from the number of moles and the mass of the soluta. (b) 2.1 ×× 102 g mol–1 51. no. Pure benzenes freeze to 5.5 °C, so the observed freezing point of this solution is depressed by ΔTf = 5.5 – 0.4 = 5.1 °C. Calculated values, assuming no ionization of HCl, ΔTf = (1.0 m)(5.14 °C/m) = 5.1 °C. The consent of these values supports the assumption that HCl is not ionized. 65. (a) XCH3OH=0.590; XCH3OH=0.590; XC2H5OH=0.410; XC2H5OH=0.410; (b) Vapy pressures are: CH3OH: 55 torr; C2H5OH: 18 torr; (c) CH3OH: 0.75; C2H5OH: 0.25 67. The ions and compounds present in the water in the beef lower the freezing point of beef below –1 °C. 69. Δbp=Kbm= (1.20°C/m)(9.41g×1mol HgCl2271.496g0.03275kg)=1.27°CΔbp=Kbm =(1.20°C/m)(9.41g×1mol HgCl2271.496g0.03275kg)=1.27°C The observed change is equivalent to a theoretical change; therefore, dissociation does not occur. 71. Colloidal system Scattered dispersion phase Medium dispersion starch starch thick solid particles air fog water air pearl carbonate (CaCO3) whipped cream airborne soap air soap jelly fruit juice pectin gel milk butterfat water ruby chromium (III) oxide (Cr2O3) aluminum oxide (Al2O3) 73. Colloidal dispersions consist of particles that are much larger than the soluts of typical solutions. Colloidal particles are either very large molecules or aggregates of smaller species that are usually large enough to scatter light. Colloids are homogeneous on a macroscopic (visual) scale, while solutions are homogeneous on a microscopic (molecular) scale. 75. If placed in an electrolytic cell, the scattered particles will move towards the charge-carrying electrode against their own charge. On this electrode, the charged particles will be neutralized and coagulated as grout. Residue.

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