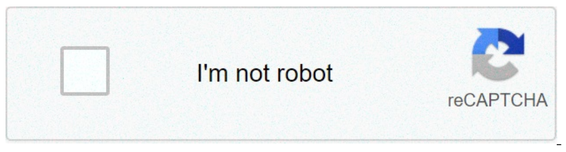

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General chemistry 1 answer key

This page contains links to: Worksheets, Worksheet Answer Keys, Nomenclature and Study Sheets General Chemistry II (Chem 222) Worksheets Worksheet #1 Worksheet #2 Worksheet #3 Worksheet #4 Worksheet #5 Worksheet #6 Worksheet #7 Worksheet #8 Worksheet #9 Worksheet #10 Worksheet #11 General Chemistry II (Chem 222) Worksheet Answer Keys Worksheet #1 Worksheet #2 Worksheet #3 Worksheet #4 Worksheet #5 Worksheet #6 Worksheet #7 Worksheet #8 Worksheet #9 Worksheet #10 Worksheet #11 Naming chemical compounds General Chemistry I & II Nomenclature Sheets Auxiliary Ch. 11 notes / derivation guides Pegasi and skaters Simple cubic, body-centered cubic and face-centered cubic unit cells General Chemistry II Study Sheets Exam #1 Exam #2 Ch. 19 & 20.5-20.8 (Last study sheet for the Final exam) Ch 17b Buffer,Titration, and Solubility Practice Problems and Answers and Video Answers with more logic/process displayed Ch 14 Thermodynamics Practice Problems and Answers and Video Answers with more logic/process displayed This text is designed for CHE151 - General Chemistry I. For many students, this course provides the foundation to a career in chemistry, while for others, this may be their only college-level science course. As such, this textbook provides an important opportunity for students to learn the core concepts of chemistry and understand how those concepts apply to their lives and the world around them. The text has been developed to meet the scope and sequence of most general chemistry courses. Contributors Unit 1: Foundations of Chemistry Module 2: Properties of Matter Classify matter as element, compound, or mixtures. Describe the four states of matter. Recognize physical and chemical changes and properties. Module 3: Measurements Convert among the temperature scales of Fahrenheit, Celsius, and Kelvin. Convert units using dimensional analysis. Determine the accuracy and precision of sets of data. Record measurements and calculations using the correct number of significant figures. Use the International System of Units for measurements. Module 4: Atomic Theory Describe the contributions of John Dalton to modern atomic theory. Describe the evolution of the atomic theory. Module 5: Elements and Compounds Apply the concepts of isotopes and their percent abundance to make calculations associated with atomic mass. Describe how chemical bonds form. Describe the arrangement of the periodic table of elements. Distinguish between molecular and ionic compounds. Interpret chemical symbols for isotopes and ions. Name chemical compounds. Write chemical formulas for compounds. Unit 2: Reactions and Stoichiometry Module 7: The Mole Calculate the percent composition of a compound. Convert amounts of substances among moles, particles, and mass. Determine formulas for empirical and molecular formulas. Module 8: Aqueous Solutions Apply concepts of mass percentage, volume percentage, parts per million, and parts per billion. Calculate concentrations of solutions that involve molarity. Describe aqueous solutions. Module 9: Chemical Equations Describe acid-base reactions. Describe oxidation-reduction reactions. Describe precipitation reactions. Represent chemical reactions with chemical equations. Module 10: Reaction Stoichiometry Apply stoichiometric relationships to calculate amounts of substances involved in chemical reactions. Calculate the percent yield of a chemical reaction. Identify limiting reactants in chemical reactions. Unit 3: Gases Module 12: Gas Laws Calculate pressure, temperature, volume, or amount of gas by applying the appropriate gas law. Make calculations involving gas pressure as it relates to the measurement of gas pressure. Module 13: Stoichiometry of Gases Apply combined concepts of stoichiometry and the ideal gas law to calculate the amounts of substances in a chemical reaction. Apply Dalton's law of partial pressures. Apply stoichiometric relationships to calculate amounts of substances involved in chemical reactions. Module 14: The Kinetic-Molecular Theory Describe the relationship between molecular velocities, kinetic energy, and molar mass of gases. Describe the relationship between the kinetic molecular theory and the gas laws. Explain the differences between ideal gases and real gases. Unit 4: Thermochemistry Module 16: Introduction to Energy Calculate internal energy for processes and explain its classification as a state function. Describe the nature of energy changes that accompany chemical and physical changes. Module 17: Calorimetry Calculate heat transferred in chemical and physical processes. Distinguish the related properties of heat, thermal energy, and temperature. Module 18: Enthalpy Calculate enthalpy changes for various chemical reactions. Unit 5: Electronic Structure and Periodic Properties Module 20: Electromagnetic Energy and the Bohr Model of the Atom Describe the Bohr model of the hydrogen atom. Describe the particle nature of light. Describe the wave nature of light. Module 21: Quantum Theory Describe the general idea of the quantum mechanical model of the atom. List and describe traits of the four quantum numbers that form the basis for completely specifying the state of an electron in an atom. Write electron configurations for elements and identify valence electrons from them. Module 22: Periodic Properties Describe and distinguish between ionization energy and electron affinity. Describe and explain the observed periodic trends of atomic and ionic size. Unit 6: Chemical Bonding and Molecular Geometry Module 24: Ionic and Covalent Bonding Assess the polarity of covalent bonds. Describe covalent bond formation. Describe ionic bond formation. Module 25: Lewis Structures Draw Lewis structures depicting the bonding in molecules. Explain the concept of resonance and draw Lewis structures representing resonance forms for a given molecule. Use average covalent bond energies to estimate enthalpies of reactions. Use formal charges to identify the most reasonable Lewis structure for a given molecule. Module 26: Molecular Structure and Polarity Assess the polarity of a molecule based on its bonding and structure. Predict the structures of small molecules using valence shell electron pair repulsion (VSEPR) theory. Module 27: Advanced Theories of Covalent Bonding Apply the concept of Covalent Bond Theory to describe covalent bonds in molecules. Apply the concept of hybridization to describe covalent bonds. Unit 7: Solids and Liquids Module 29: Intermolecular Forces Describe the roles of intermolecular attractive forces in viscosity, surface tension, and capillary rise. Describe the types of intermolecular forces possible between atoms or molecules in condensed phases. Identify the types of intermolecular forces experienced by specific molecules based on their structures. Module 30: Phase Changes Describe the processes represented by typical heating and cooling curves, and compute heat flows and enthalpy changes accompanying these processes. Explain the relation between phase transition temperatures and intermolecular attractive forces. Use phase diagrams to identify stable phases at given temperatures and pressures, and to describe phase transitions resulting from changes in these properties. Module 31: The Solid State of Matter Define and describe the bonding and properties of ionic, molecular, metallic, and covalent network crystalline solids. Unit 8: Solutions Module 33: Solubility Describe the basic properties of solutions and how they form. Describe the solubility of gases, liquids, and solids in liquids. Explain solute-solvent interactions of ionic and covalent electrolytes. Module 34: Colligative Properties Express concentrations of solution components using mole fraction and molality. Perform calculations using the mathematical equations that describe various colligative effects. UNIT 1: Foundations of Chemistry Module 1: Course Introduction Module 2: Properties of Matter QUIZ: Properties of Matter Module 3: Measurements QUIZ: Measurements Module 4: Atomic Theory QUIZ: Atomic Theory Module 5: Elements and Compounds QUIZ: Elements and Compounds UNIT 2: Reactions and Stoichiometry Module 6: Introduction Module 7: The Mole QUIZ: The Mole Module 8: Aqueous Solutions QUIZ: Aqueous Solutions Module 9: Chemical Equations QUIZ: Chemical Equations Module 10: Reaction Stoichiometry QUIZ: Reaction Stoichiometry Module 11: Reactions and Stoichiometry: Unit Practice UNIT 3: Gases Module 12: Introduction Module 13: Gas Laws QUIZ: Gas Laws Module 14: Stoichiometry of Gases QUIZ: Stoichiometry of Gases Module 15: The Kinetic-Molecular Theory QUIZ: The Kinetic Molecular Theory UNIT 4: Thermochemistry Module 16: Introduction Module 17: Introduction to Energy QUIZ: Introduction to Energy Module 18: Calorimetry QUIZ: Calorimetry Module 19: Enthalpy QUIZ: Enthalpy UNIT 5: Electronic Structure and Periodic Properties Module 20: Introduction Module 21: Electromagnetic Energy and the Bohr Model of the Atom QUIZ: Electromagnetic Energy and the Bohr Model of the Atom Module 22: Quantum Theory QUIZ: Quantum Theory Module 23: Periodic Properties QUIZ: Periodic Properties Module 24: Electronic Structure and Periodic Properties: Unit Practice UNIT 6: Chemical Bonding and Molecular Geometry Module 25: Introduction Module 26: Ionic and Covalent Bonding QUIZ: Ionic and Covalent Bonding Module 27: Lewis Structures QUIZ: Lewis Structures Module 28: Molecular Structure and Polarity QUIZ: Molecular Structure and Polarity Module 29: Advanced Theories of Covalent Bonding QUIZ: Advanced Theories of Covalent Bonding UNIT 7: Solids and Liquids Module 30: Introduction Module 31: Intermolecular Forces QUIZ: Intermolecular Forces Module 32: Phase Changes QUIZ: Phase Changes and Diagrams Module 33: The Solid State of Matter QUIZ: The Solid State of Matter UNIT 8: Solutions Module 34: Introduction Module 35: Solubility QUIZ: Solubility Module 36: Colligative Properties QUIZ: Colligative Properties UNIT 9: Appendix Module 37: Appendix OLI system requirements, regardless of course: internet access an operating system that supports the latest browser update the latest browser update (Chrome recommended; Firefox, Safari supported; Edge and Internet Explorer are supported but not recommended) pop-ups enabled cookies enabled Some courses include exercises with exceptions to these requirements, such as technology that cannot be used on mobile devices. This course's system requirements: A full desktop operating system, such as Windows or Mac OS X. Flash Java Students are prompted for payment during the OLI course registration process, and can pay with a credit card or an OLI Payment Code purchased from your campus bookstore. Learn about offering OLI Payment Codes in your bookstore. Bulk discounts and alternative payment arrangements are available, including institutional or departmental payments. Learn about discounts and payment options. 1. Place a glass of water outside. It will freeze if the temperature is below 0 °C. 3. (a) law (states a consistently observed phenomenon, can be used for prediction); (b) theory (a widely accepted explanation of the behavior of matter); (c) hypothesis (a tentative explanation, can be investigated by experimentation) 5. (a) symbolic, microscopic; (b) macroscopic; (c) symbolic, macroscopic; (d) microscopic 7. Macroscopic. The heat required is determined from macroscopic properties. 9. Liquids can change their shape (flow); solids can't. Gases can undergo large volume changes as pressure changes; liquids do not. Gases flow and change volume; solids do not. 11. The mixture can have a variety of compositions; a pure substance has a definite composition. Both have the same composition from point to point. 13. Molecules of elements contain only one type of atom; molecules of compounds contain two or more types of atoms. They are similar in that both are comprised of two or more atoms chemically bonded together. 15. Answers will vary. Sample answer: Gatorade contains water, sugar, dextrose, citric acid, salt, sodium chloride, monopotassium phosphate, and sucrose acetate isobutyrate. 17. (a) element; (b) element; (c) compound; (d) mixture; (e) compound; (f) compound; (g) compound; (h) mixture19. In each case, a molecule consists of two or more combined atoms. They differ in that the types of atoms change from one substance to the next. 21. Gasoline (a mixture of compounds), oxygen, and to a lesser extent, nitrogen are consumed. Carbon dioxide and water are the principal products. Carbon monoxide and nitrogen oxides are produced in lesser amounts. 23. (a) Increased as it would have combined with oxygen in the air thus increasing the amount of matter and therefore the mass. (b) 0.9 g 25. (a) 200.0 g; (b) The mass of the container and contents would decrease as carbon dioxide is a gaseous product and would leave the container. (c) 102.3 g 27. (a) physical; (b) chemical; (c) chemical; (d) physical; (e) physical 31. The value of an extensive property depends upon the amount of matter being considered, whereas the value of an intensive property is the same regardless of the amount of matter being considered. 33. Being extensive properties, both mass and volume are directly proportional to the amount of substance under study. Dividing one extensive property by another will in effect "cancel" this dependence on amount, yielding a ratio that is independent of amount (an intensive property). 37. (a) kilograms; (b) meters; (c) meters/second; (d) kilograms/cubic meter; (e) kelvin; (f) square meters; (g) cubic meters39. (a) centi-, $\times\times 10^{-2}$; (b) deci-, $\times\times 10^{-1}$; (c) Giga-, $\times\times 10^{9}$; (d) kilo-, $\times\times 10^{3}$; (e) milli-, $\times\times 10^{-3}$; (f) nano-, $\times\times 10^{-9}$; (g) pico-, $\times\times 10^{-12}$; (h) tera-, $\times\times 10^{12}$ 41. (a) 8.00 kg, 5.00 L, 1.60 kg/L; (b) 2.00 kg, 5.00 L, 0.400 kg/L; (c) red < green < blue < yellow; (d) red < green < blue < yellow; (e) If the volumes are the same, then the density is directly proportional to the mass.43. (a) (b) Answer is one of the following. A/yellow: mass = 65.14 kg, volume = 3.38 L, density = 19.3 kg/L, likely identity = gold. B/blue: mass = 0.64 kg, volume = 1.00 L, density = 0.64 kg/L, likely identity = apple. C/green: mass = 4.08 kg, volume = 5.83 L, density = 0.700 kg/L, likely identity = gasoline. D/red: mass = 3.10 kg, volume = 3.38 L, density = 0.920 kg/L, likely identity = ice; and E/purple: mass = 3.53 kg, volume = 1.00 L, density = 3.53 kg/L, likely identity = diamond. (c) B/blue/apple (0.64 kg/L) < C/green/gasoline (0.700 kg/L) < D/red/ice (0.920 kg/L) < E/purple/diamond (3.53 kg/L) < A/yellow/gold (19.3 kg/L)45. (a) 7.04 $\times\times$ 102; (b) 3.344 $\times\times 10^{-2}$; (c) 5.479 $\times\times$ 102; (d) 2.2086 $\times\times$ 104; (e) 1.00000 $\times\times$ 103; (f) 6.51 $\times\times 10^{-8}$; (g) 7.157 $\times\times 10^{-3}$ 47. (a) exact; (b) exact; (c) uncertain; (d) exact; (e) uncertain; (f) uncertain 49. (a) two; (b) three; (c) five; (d) four; (e) six; (f) two; (g) five 51. (a) 0.44; (b) 9.0; (c) 27; (d) 140; (e) 1.5 $\times\times 10^{-3}$; (f) 0.4453. (a) 2.15 $\times\times$ 105; (b) 4.2 $\times\times$ 106; (c) 2.08; (d) 0.19; (e) 27,440; (f) 43.0 55. (a) Archer X; (b) Archer W; (c) Archer Y 57. (a) 1.0936 yd1 m1.0936 yd1 m; (b) 0.94635 L1 qt0.94635 L1 qt; (c) 2.2046 lb1 kg2.2046 lb1 kg 59. 2.0 L67.6 fl oz=0.030 L1 fl oz2.0 L67.6 fl oz=0.030 L1 fl oz Only two significant figures are justified. 67. 71. (a) 1.3 $\times\times 10^{-4}$ kg; (b) 2.32 $\times\times$ 108 kg; (c) 5.23 $\times\times 10^{-12}$ m; (d) 8.63 $\times\times 10^{-5}$ kg; (e) 3.76 $\times\times 10^{-1}$ m; (f) 5.4 $\times\times 10^{-5}$ m; (g) 1 $\times\times$ 1012 s; (h) 2.7 $\times\times 10^{-11}$ s; (i) 1.5 $\times\times 10^{-4}$ K 77. (a) 394 ft; (b) 5.9634 km; (c) 6.0 $\times\times$ 102; (d) 2.64 L; (e) 5.1 $\times\times$ 1018 kg; (f) 14.5 kg; (g) 324 mg81. Yes, the acid's volume is 123 mL. 83. 62.6 in (about 5 ft 3 in.) and 101 lb 85. (a) 3.81 cm $\times\times$ 8.89 cm $\times\times$ 2.44 m; (b) 40.6 cm 89.

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