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Study guide for content mastery chapter 9

are always nonpolar. For binary acids, the hydrogen part of the compound is named using the prefix hydro-. The chocolate chips should be labeled with negative charge or as electrons. a tiny fraction of the mass of an atom. 7. Dalton thought that all atoms of a specific element have the same mass. The number of bonding pairs in a molecule is equal to the number of b. Which of the following correctly describes the compound carbon tetrachloride, CCl4? 28. cesium-133 234U 92 133Cs 55 mass number atomic number 24Mg 12 d. measure intermolecular distances. polar overall, with polar covalent bonds In your textbook, read about the properties of covalent compounds. francium; 0.7; alkali metals; group 1A a. Neutron 8. An example of a molecule that has this type of orbital is (11) methane . ionic c. HBr h. Label the mass number and the atomic number on the following isotope notation. false 1. Gamma rays have no charge. The bond angle is the angle between a. BF3 The formation of new orbitals from a combination or rearrangement of valence electrons d 15. Fast-moving electrons spontaneously Hole Negative plate affected by the electric field. hydrobromic acid b. If the electrons shared are centered between the two atoms, the attachment is called a(n) (4) sigma bond . CO2 b. Electron Chemistry: Matter and Change • Chapter 4 Location Symbol Particle 1/1840 1 1 Relative Mass Study Guide for Content Mastery 1 0 1 Relative Charge Complete the following table of proton, electron, and neutron characteristics. The orbitals that are produced in this way are a 16. a(n) (1) covalent bond . Bond length is the distance between c. Chemistry: Matter and Change • Chapter 4 High-energy electromagnetic radiation Electrons, or beta particles 10. electrons. The atomic mass of an atom is usually not a whole number because it accounts for d. nitric acid a. Rutherfordium has an atomic number of 104. true 3. 2. the nucleus 0.79 0.89 1.10 1.3 1.5 1.7 1.9 2.2 2.2 2.2 2.4 1.9 1.8 1.8 1.9 2.0 2.2 b. 10. trigonal planar. the tendency of an atom to attract electrons a. Rutherford b. write resonance structures. nonpolar because it is linear. i 10. Section 4.4 CHAPTER Name 48 Chemistry: Matter and Change • Chapter 8 Study Guide for Content Mastery In your textbook, read about metallic bonds. HNO2 f. What is the atomic mass of osmium? true 7. When sharing of electrons occurs, the attachment between atoms that results is called false 3. a nonpolar covalent bond. Li Be Metalloid BCNOF 0.98 1.57 2.04 2.55 3.04 3.44 3.98 9. Explain why the gamma rays do not bend. Using the table of electronegativities on the preceding page, circle the letter of the choice that best completes the statement or answers the question. only the relative abundance of the atom's isotopes. particular element. radiation b. Calculated the mass of an electron 2. Transcript Study Guide for Content Mastery Answer Key Chemistry: Matter and Change T167 4 Early Theories of Matter element is called an atom. The outer circle of the peach should be labeled electrons. Millikan a. radioactive decay c. electrons are attracted to the nucleus. b. The carbon dioxide molecule contains two double bonds. 1.61 1.90 2.19 2.58 3.16 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 10. Study Guide for Content Mastery Chemistry: Matter and Change • Chapter 9 53 54 Chemistry: Matter and Change • Chapter 9 Study Guide for Content Mastery Copyright © Glencoe/McGraw-Hill, a division of the McGraw-Hill Companies, Inc. 24. determine ionic charge. Which of the following relationships relating to bond length is generally correct? Drawing should look like a peach with a pit. false 5. the shorter the bond, the lower the bond dissociation energy Study Guide for Content Mastery Chemistry: Matter and Change • Chapter 9 49 50 Chemistry: Matter and Change • Chapter 9 Study Guide for Content Mastery Copyright © Glencoe/McGraw-Hill, a division of the McGraw-Hill Companies, Inc.Copyright © Glencoe/McGraw-Hill, a division of the McGraw-Hill Companies, Inc.Study Guide for Content Mastery Answer Key Name Date Class Name Date Class CHAPTER 9 STUDY GUIDE FOR CONTENT MASTERY CHAPTER 9 STUDY GUIDE FOR CONTENT MASTERY Section 9.3 Molecular Structures Section 9.4 Molecular Shape In your textbook, read about Lewis structures. For each item in Column A, write the letter of the matching item in Column B. The second element in the formula of a binary compound is named using the suffix -ite. Most atoms have either a positive or a negative charge. covalent bond molecule sigma bond exothermic pi bond false 2. osmium: 76 protons, 76 electrons; niobium: 41 protons, 41 electrons 31. polar covalent. as molecules containing three atoms c 9. Positive plate 3. 2.20 3 4 Metal 567 89 b. Section 9.1 The Covalent Bond For each statement below, write true or false. Column A Column B carbon carbon dioxide hybridization sp3 identical methane sp phosphorus trihydride c 13. There are no instruments powerful enough to magnify atoms so that they research. all of the above. 4. CO a. How many protons does oxygen have? Chemistry: Matter and Change • Chapter 4 12. the orbitals of a bonding atom. 4.0 Rb Sr Y Zr Nb Mo Tc Ru Rh Pd Ag Cd In Sn Sb Te I 0.82 0.95 1.22 1.33 1.6 2.16 2.10 2.2 2.28 2.20 1.93 1.69 1.78 1.96 2.05 2.1 2.66 55 56 57 72 73 74 75 76 77 78 79 80 81 82 83 84 85 11. only the mass of each of the atom's isotopes. Unequal sharing of electrons between two bonded atoms always indicates H a. the mass of the atom's electrons. its mass 4. The rays and particles that are emitted by a radioactive material Column A For each item in Column A, write the letter of the matching item in Column B. 102 protons; 102 electrons 12. ammonia 8. Dalton's atomic theory stated that atoms of different elements combine in smaller particles. Across a period? In naming the first element in a formula, the prefix mono- is not used. approximately the mass of one proton plus one neutron. 1/16 the mass of an oxygen-16 atom. Democritus proposed that atoms are held together by chemical bonds, but 8. The mass of an electron is Circle the letter of the choice that best completes the statement. Odd number of valence electrons a. An isotope has atomic number 19 and mass number 39. Beta Composition 8. carbonic acid b. d 14. Determined the mass-to-charge ratio of an electron 1. A reaction that involves a change in an atom's nucleus In your textbook, read about types of radiation. To find the total number of electrons available for bonding in a positive 3. as single atoms c. 23. both the relative abundance and the mass of each of the atom's isotopes. 29. false 2. Which element has the lowest electronegativity? bromic acid 9. For each statement below, write true or false. The shape of a molecule that has two covalent single bonds and no lone pairs on the true 9. ionic. central atom is false 10. The prefix tetra- indicates three atoms. Then use the periodic table to identify each element. c Class Subatomic Particles and the Nuclear Atom 4 Date In your textbook, read about discovering the electron and the nuclear atom. tetrahedral. How many protons and electrons does lead have? carbon dioxide a. between two atoms? Polonium has an atomic number of 84. 32. two molecules of the same substance. Proposed the nuclear atomic model In the nucleus In the space surrounding the nucleus p n0 e 6. smaller than the mass of a proton. Answer the following questions. Which plate do the beta particles bend toward? When such an attachment is formed, bond dissociation true 4. carbon monoxide a. 104 protons; 104 electrons 10. What is the chemical symbol for niobium? uranium-234 20. Binary molecular compounds are generally composed of a metal and a nonmetal. trigonal pyramidal. 22 Chemistry: Matter and Change • Chapter 4 Study Guide for Content Mastery d. Section 4.3 CHAPTER Name 4 51 protons, 51 electrons, 72 neutrons 4He 2 22Ne 10 21. the shorter the bond, the stronger the bond b. 9. An example of an element that commonly undergoes such formation is (9) carbon . 14 protons, 14 electrons, 14 neutrons 14. 8. the less electronegative atom in a polar covalent bond d. Study Guide for Content Mastery 19 protons, 19 electrons, 21 neutrons 15. Nb 92.906 Os Niobium 41 190.2 Osmium 76 Date 23 STUDY GUIDE FOR CONTENT MASTERY Use the figures to answer the following questions. neon-22 Write each isotope below in symbolic notation. true 1. none b. The dough should be labeled as evenly distributed positive charges. polar or not? A structural formula shows the arrangement of the atoms in a molecule. Alpha Radiation Type 0 0 4He 2 0 1 0 1/1840 4 Mass (amu) 0 1 2 Study Guide for Content Mastery Symbol Charge The beta particles have less mass than the alpha particles and are more greatly Complete the following table of the characteristics of alpha, beta, and gamma radiation. How many electrons are shared in a double covalent bond? Section 4.2 CHAPTER Name T168 Chemistry: Matter and Change Study Guide for Content Mastery Answer Key 5. smaller than the mass of a neutron. determine molecular shape. nonpolar overall, with polar covalent bonds d. electrons are shared equally. The pit should be labeled nucleus and should include labeled protons and neutrons. The periodic table is arranged by increasing atomic number. 1 Electronegativities of Some Elements 8. affinity. true 8. In your textbook, read about the nature of covalent bonds. Resonance occurs when more than one valid Lewis structure can be 4. All electrons in an atom are available for bonding. Section 4.3 continued CHAPTER Name Copyright © Glencoe/McGraw-Hill, a division of the McGraw-Hill Companies, Inc. Use the diagram of metallic bonding to answer the following questions. 2.7 d. How are the electronegativity values used to determine the type of bond that exists 16. there is always an octet of electrons around an atom in a molecule. helium 18. If the sharing involves the overlap of false 7. N2O4 e. In your textbook, read about the discovery of protons and neutrons. The two isotopes with atomic number 19 are both isotopes of potassium. 19 STUDY GUIDE FOR CONTENT MASTERY 3. 1. Dalton's atomic theory was based on careful measurements and extensive no one believed him. 1/12 the mass of a carbon-12 atom. electrons are transferred. true 11. 19. false true true true Class 1. shared and unshared electron pairs repel each other as much as possible. nuclear atomic model 20 c. c. Calculate the atomic mass of each element described below. polar overall, with nonpolar covalent bonds The values are subtracted. Identify the Answer the following question. Molecules containing only polar covalent bonds c. as molecules containing four atoms 7. The smallest particle of an element that retains the properties of that can be seen. In your textbook, read about naming molecular compounds and oxyacids. CHAPTER 9
 STUDY GUIDE FOR CONTENT MASTERY
 SECTION 9.2
 Stream Development
 In your textbook, read about stream development.
 Answer the following questions.
 1. 82 protons; 82 electrons 6. polar overall, with polar covalent bonds 5. the more electronegative atom in a polar covalent bond 87 88 89 Fr Ra Ac 0.7 0.9 1.1 1. HBrO3 i. parallel orbitals, the attachment is called a(n) (5) pi bond . The process in which an unstable nucleus loses energy 2. 1.0 b. b a Column A For each item in Column A, write the letter of the matching item in Column B. Which element has the highest electronegativity? Philosophers formulated explanations about the nature of matter based on 1. polar because there is an electronegativity difference and the molecule is trigonal pyramidal. the nucleus and the bonding electrons. Radioactive source Lead block Use the diagram to answer the questions. When electronegativities of two bonded atoms differ greatly, the bond is 11 12 Nonmetal 13 14 15 16 17 Na Mg 0.93 1.31 Al Si P S Cl a. Lead has an atomic number of 82. Ionic compounds are usually soluble in polar substances. 30. 19 protons, 19 electrons, 20 neutrons 13. Dalton's atomic theory stated that atoms separate, combine, or rearrange 3. polar because it is linear. are always ionic. element. of the atoms present. a polar covalent bond. What are the ... CHAPTER 9
 STUDY GUIDE FOR CONTENT MASTERY
 Section 9.3
 Molecular Structures
 In your textbook, read about Lewis structures.
 For each statement below, ... CHAPTER Date Class STUDY GUIDE FOR CONTENT MASTERY Section 9.4 Molecular Shape In your textbook, read about the VSEPR model. The shape of a molecule whose central atom has four pairs of bonding electrons is written for a molecule. one c. In molecules, hydrogen is always a terminal atom. H2CO3 c. Which of the following correctly describes the compound water, H2O? Chemistry: Matter and Change • Chapter 4 12. 11. plum pudding model Draw and label a diagram of each atomic model. electrons are shared unequally. a polar molecule. Column B a. b d a 1. T182 Chemistry: Matter and Change Name Date Class Name Date Class CHAPTER 9 STUDY GUIDE FOR CONTENT MASTERY CHAPTER 9 STUDY GUIDE FOR CONTENT MASTERY Covalent Bonding Section 9.2 Naming Molecules In your textbook, read about how binary compounds and acids are named from their formulas. its geometry c. The VSEPR model is based on the idea that ion, you should add the ion charge to the total number of valence electrons a. The shape of a molecule that has three single covalent bonds and one lone pair on the false central atom is 12. (3) molecule . Both Democritus and Dalton suggested that matter is made up of atoms. In your textbook, read about mass of individual atoms. HNO3 g. f 15. NO is called (7) hybridization . Circle the letter of the choice that best completes the statement. The symbol 2 is placed next to which of the following? name and group number of the chemical family that has the highest overall electronegativities? as molecules containing two atoms d. Nitrate is an example of an ion that forms resonance structures. The prefix hexa- indicates six atoms. coordinate covalent. In your textbook, read about electronegativity. a 16. 24 Zinc sulfide coated screen Alpha particles (2 charge) Gamma rays (no charge) d. Thomson Column B Drawing should look like a ball of chocolate chip cookie dough. temperature b. O3 b 14. the shorter the bond, the weaker the bond c. its physical state d. How many protons and electrons does an osmium atom have? 22. In your textbook, read about single and multiple bonds and bond strength. dinitrogen tetroxide g 11. linear.Chemistry: Matter and Change T183 In your textbook, read about resonance structures and exceptions to the octet rule. An isotope has 14 electrons and a mass number of 28. Chemistry: Matter and Change • Chapter 4 Atomic mass of X 26.50 amu 8.957 amu 35.46 amu (34.969 amu)(75.77%) 26.50 amu 35X: Mass contribution (mass)(percent abundance) 34.969 Mass (amu) 35X Isotope The element is copper. What are the 14. false Date 21 STUDY GUIDE FOR CONTENT MASTERY How Atoms Differ 4 In your textbook, read about atomic number. 27. What is the atomic number of osmium? two d. What factor other than electronegativity determines whether a molecule as a whole is name and group number of the chemical family that has the lowest overall electronegativities? the electrons in two attached atoms. the orbitals of two attached atoms. Electronegativity tends to decrease. molecules repel one another. A nonpolar covalent bond is one in which c. 5. What is its atomic number? false 6. the sigma and pi bonds in a double bond. An isotope has 21 neutrons and a mass number of 40. An oxyacid contains only two elements. SF6 (8) identical to one another. A niobium atom? Atomic mass of X 43.53 amu 20.02 amu 63.55 amu (62.930 amu)(69.17%) 43.53 amu 63X: Mass contribution (mass)(percent abundance) 62.930 Mass (amu) 63X Isotope Study Guide for Content Mastery 33. 26. Dalton's atomic theory stated that matter is mostly empty space. 17. What units is the atomic mass reported in? false 4. Use the table of electronegativities below to answer the following questions. Use each of the terms below just once to complete the passage. 15. Section 4.3 continued CHAPTER Name Study Guide for Content Mastery Answer Key Chemistry: Matter and Change T169 4 atomic mass units 190.2 Nb 76 Class 64.928 65X 30.83 69.17 Percent Abundance (64.928 amu)(30.83%) 20.02 amu 65X: 36.966 37X 24.23 75.77 Percent Abundance (36.966 amu)(24.23%) 8.957 amu 37X: The element is chlorine. false 7. 12. The smallest ... Study Guide for Content Mastery Chapter 9 Earth Science: Geology, the Environment, and the Universe 53 SECTION 9.1 Surface Water Movement In your textbook, read about surface water ... chapter review questions, real-world scenarios, and hands-on exercises, this study guide also readies you for specific aspects of Exam 70-631, including: deploying Windows SharePoint ... In your textbook, read about the VSEPR model. nonpolar because there is no electronegativity difference. are always polar. In the sulfate ion (SO_4^{2-}), 32 electrons are available for bonding. their own experiences. false 8. Column A Column BStudy Guide for Content Mastery Answer Key a. Dalton was correct in thinking that atoms could not be divided into 5. beta radiation 7. In your textbook, read about hybridization. Astatine has 85 protons. linear. Study Guide for Content Mastery true false true false true true true false false true true true false For each statement below, write true or false. an ionic bond. polar overall, with nonpolar covalent bonds b. What general trend in electronegativity do you note going down a group? Circle the letter of the choice that best completes the ... Class STUDY GUIDE FOR CONTENT MASTERY Naming Molecules 9 Date In your textbook, read about how binary compounds and acids are named from their ... Study Guide for Content Mastery Answer Key Chemistry: Matter and Change T167 4 Early Theories of Matter element is called an atom. Section 4.1 Class STUDY GUIDE FOR CONTENT MASTERY Date The Structure of the Atom CHAPTER Name Copyright © Glencoe/McGraw-Hill, a division of the McGraw-Hill Companies, Inc. The VSEPR model is used mainly to a. a positive ion Cs Ba La Hf Ta W Re Os Ir Pt Au Hg Tl Pb Bi Po At a. 84 protons; 84 electrons 11. Which of the isotopes in problems 13–16 are isotopes of the same element? Class STUDY GUIDE FOR CONTENT MASTERY Date 16. Oxygen has 8 electrons. d. c Class STUDY GUIDE FOR CONTENT MASTERY Date Changes to the Nucleus—Nuclear Reactions 4 In your textbook, read about radioactivity. exactly the mass of one proton. How many protons and electrons does it have? 6. 1.7 c. Proton 7. What is the meaning of the term electronegativity? four e 12. Atomic number is equal to the number of electrons in an atom. A molecule of ammonia, NH3, is a. Explain why the path of the beta particles bends more than the path of the alpha particles. Zinc has 30 protons. What is the numerical value? An isotope has an atomic number 51 and a mass number 123. Electronegativity tends to increase. bonded atoms. In what form do elements such as hydrogen, nitrogen, and oxygen normally occur? in chemical reactions. The number of protons in an atom identifies it as an atom of a 3. both electrons are provided by the same atom. When carbon and oxygen bond, the molecule contains ten pairs of bonding electrons. NH3 d. atoms bond by means of electron sharing, the resulting particle is called a(n) true 6. Nobelium has an atomic number of 102. fluorine; 3.98; halogens; group 7AStudy Guide for Content Mastery Answer Key 3. The electrons in a coordinate covalent bond are donated by both the d. 0.82 1.00 1.36 1.54 1.63 1.66 1.55 1.83 1.88 1.91 1.90 1.65 1.81 2.01 2.18 2.55 2.96 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 a. Ancient philosophers regularly performed controlled experiments. Gamma Helium nuclei, or alpha particles 9. If the name of the anion of an oxyacid ends in -ate, the acid name contains the suffix -ous. One atomic mass unit is c. When this atom combines its three p orbitals and its one s orbital, the orbitals that result are called (10) sp3 orbitals. In a covalent molecular compound, the attraction between molecules tends to be strong. energy is released, and the process is (2) exothermic . In your textbook, read about the philosophers, John Dalton, and defining the atom. a. nitrous acid b 13. What is the electronegativity difference that usually is the dividing line between covalent K Ca Sc Ti V Cr Mn Fe Co Ni Cu Zn Ga Ge As Se Br and ionic bonds? What are the 13. More than one valid Lewis structure d. When two or more true 5. Explain. Use the periodic table to determine the atomic number of each isotope. Study Guide for Content Mastery Chemistry: Matter and Change • Chapter 9 51 52 Chemistry: Matter and Change • Chapter 9 Study Guide for Content MasteryT184 Chemistry: Matter and Change Name Date Class Name Date Class CHAPTER 9 STUDY GUIDE FOR CONTENT MASTERY CHAPTER 9 STUDY GUIDE FOR CONTENT MASTERY Section 9.5 continued Section 9.5 Electronegativity and Polarity In your textbook, read about bond polarity. 25. nuclear reaction Beta particles (1 charge) the positive plate, because beta particles are negatively charged 5. may or may not be polar. Circle the letter of the choice that best completes the statement or answers the question. The central atom in a molecule is the one with the highest electron b. two terminal atoms and the central atom. More than 8 electrons around central atom c. Determine the number of protons, electrons, and neutrons for each isotope described below. the shorter the bond, the fewer the electrons in it d. h 17. In your textbook, read about isotopes and mass number. simple whole-number ratios to form compounds. Fewer than 8 electrons around an atom b. the nuclei of two attached atoms. true 6. 30 85 8 protons Chemistry: Matter and Change • Chapter 4 Copyright © Glencoe/McGraw-Hill, a division of the McGraw-Hill Companies, Inc. The number of neutrons in an atom is referred to as its atomic number.