Chemistry chapter 7 8 9 test answers

1. The protons in the nucleus do not change during normal chemical reactions. Only the outer electrons move. Positive charges are formed when electrons are lost. 3. P, I, Cl, and O would form anions because they are nonmetals. Mg, In, Cs, Pb, and Co. would form cations because they are metals. 5. (a) P3-; b) Mg2+; c) Al3+; (d) O2-; (e) Cl-; f) Cs+ 7. a) [Ar]4s23d104p6, b) [Kr]4d105s25p6 (c) 1s2 (d) [Kr]4d10; e) [He]2s22p6; f) [Ar]3d10; g) 1s2 (h) [He]2s22p6 (i) [Kr]4d105s2 (j) [Ar]3d7 (k) [Ar]3d6, l) [Ar]3d104s29. (a) 1s22s22p63s23p1; Al3+: 1s22s22p6; (b) 1s22s22p63s23p63d104s24p5. 1s22s22p63s23p63d104s24p6; (c) 1s222p63s23p63d104s24p65s2. Sr2+: 1s22s22p63s23p63d104s24p6; (d) 1s22s1. Li+: 1s2; (e) 1s22s22p63s23p63d104s24p3. 1s22s22p63s23p63d104s24p6; (f) 1s22s22p63s23p4. 1s22s22p63s23p6 11. NaCl consists of discrete ions arranged in a crystal lattice, not covalently bound molecules. 13. Ionic: (b), d, e, g, and (i); covalent: (a), (c), (f), (h), (j), and (k) 15. (a) Cl, (b) O, (c) O, (d) S. (e) N. (f) P. (g) N 17. (a) H, C, N, O, F, (b) H, I, Br, Cl, F; (c) H, P, S, O, F, (d) Na, Al, H, P, O. e) Ba, H, As, N, O 21. (a) HF. (b) CO. (c) OH, (d) PCl. (e) NH, (f) PO. (g) CN 23. a) eight electrons: b) eight electrons: c) no electrons Be2+ (d) eight electrons: e) no electrons Ga3+ (f) no electrons Li+ (g) eight electrons: 25. (a) (b) (c) (d) (e) (f) (f) 27. 29. (a) In this case, the Lewis structure is insufficient to depict the fact that experimental studies have shown two unpaired electrons in each oxygen molecule. (b) (c) (d) (e) (f) (h) (i) (j) (k) 31. a) SeF6: (b) XeF4: (c) SeCl3+:SeCl3+: (d) Cl2BBCl2: 33. Two valence electrons per Pb atom are transferred to Cl atoms; the resulting Pb2+ ion has a 6s2 valence shell configuration. Two of the valence electrons in the HCl molecule are split, and the other six are located on the Cl atom as single electron pairs. 35. 37. 39. (a) (b) (c) (d) (e) 41. 43. Each binding involves a division of electrons between atoms. Two electrons are divided into a single bond; four electrons are divided into a double bond; and six electrons are divided into a triple bond. 45. (a) (b) (c) (d) (e) 47. 49. (a) (b) CO has the strongest carbon-oxygen bond because there is a triple bond that joins C and O. CO2 has double bonds. 51. (a) H: 0, Cl: 0; (b) C: 0, F: 0.c) P: 0, Cl 0. (d) P: 0, F: 0 53. Cl in Cl2: 0; Cl in BeCl2: 0; Cl in ClF5: 0 55. (a) (a) (c) 59. The structure of zero formal charges is compatible with the actual structure: 61. NF3; 63. 65. (a) −114 kJ, (b) 30 kJ, (c) −1055 kJ67. The greater bond energy is in the figure on the left. It's the more stable shape. 69. DHCl=ΔH°=ΔHf[HCl(g)]++ΔHf[H(g)]++ΔHf[Cl(g)]= \(−92.307kJ)+217.97kJ+121.3kJ=431.6kJDHCl =ΔH°=ΔHf[HCl(g)]++ΔHf[H(g)]°+ΔHF[Cl(g)]=(−92.307kJ)+217.97kJ+121.3kJ=431.6kJ71. The S-F bond in SF4 is stronger. 73. The only bonds C to C are longest. 75. (a) When two electrons are removed from the valence shell, the Ca radius loses the ultimate energy level and returns to the lower n = 3 level, which is much smaller in radius. (b) The +2 charge on calcium draws oxygen much closer compared to K, thereby increasing the lattice energy relative to a less charged ion. (c) Removal of the 4s electron in Ca requires more energy than the removal of the 4s electron in K due to the stronger attraction of the nucleus and the extra energy required to break the pairing of the electrons. (b) The second ionization energy for K requires the removal of an electron from a lower energy level, where the attraction is much stronger from the core of the electron. In addition, energy is required to insecurrently two electrons in a full orbital. For Ca, the second ionization potential requires that only one single electron be removed in the exposed external energy level. d) In Al, the removed electron is relatively unprotected and unarmanated in a p orbital. The higher energy of Mg mainly reflects the disavation of the 2s electron. 79. 4008 kJ/mol, both ions in MgO have twice the charge of the ions in LiF; the bond length is very similar and both have the same structure; a quadrupling of energy is expected based on the equation for dithering energy 81. a) Na2O, Na+ has a smaller radius than K+; (b) BaS. BA has a larger charge than K; (c) BaS. Ba and S have larger fees; (d) BaS. S has a larger charge 85. The placement of the two sets of unpaired electrons in water forces the bonds to adopt a tetraedral arrangement, and the resulting HOH molecule is bent. The HBeH molecule (in which Be has only two electrons to bind with the two electrons from the hydrogen) must have the electron pair as far from one another as possible and is therefore linear. 87. Space must be available for each pair of electrons, whether they are in a bond or are present as single pairs. Electron-pair geometry considers the location of all electrons. The molecule structure considers only bonding-par geometry. 89. As long as the polar bonds are compensated (for example, two identical atoms are found directly over the central atom from each other), the molecule may be nonpolar. 91. (a) Both the electron geometry and the molecular structure are octaedral. b Both the electron geometry and the molecular structure are trigonal bipyramid. (c) Both the electron geometry and the molecular structure are linear. d Both the electron geometry and the molecular structure are trigonal planar.93. (a) Electron-pair geometry: octaedral, molecular structure: square pyramidal. (b) Electron-Pair geometry: molecular structure: bent; (c) Electron-pair geometry means octaedral, molecular structure: square plane; (d) Electron-pair geometry means tetrahedron, molecular structure: trigonal pyramidal. (e) Electron-pair geometry: trigonal village pyramidal, molecular structure: seesaw. (f) Electron-pair geometry: tetrahedron, molecular structure: curved (109°)95. a) Electron-pair geometry: trigonal planar, molecular structure: curved (120°); b) Electron-Pair geometry: linear, molecular structure: linear. (c) Electron-pair geometry means trigonal planar, molecular structure: trigonal planar. (d) Electron-pair geometry means tetrahedron, molecular structure: trigonal pyramidal. (e) Electron-pair geometry means tetrahedron, molecular structure: tetrahedrons; (f) Electron-pair geometry: trigonal bipyramidal, molecular structure: seesaw; (g) Electron-pair geometry: tetraedral, molecular structure: trigonal pyramidal 97. All these molecules and ions contain polar bonds. Only ClF5, ClO2−ClO2−, PCl3, SeF4 and PH2−PH2− have dipole moments. 99. SeS2, CCl2F2, PCl3, and ClNO all have dipole moments. 105. (a) tetrahedrons, (b) trigonal pyramidal. (c) bent (109°). (d) Trigonal planework. (e) bent (109°). (f) bent (109°). g) CH3CCH tetraedral, CH3CCH linear; (h) tetrahedrons. i) H2CCCH2 linear, H2CCCH2 trigonal planar 107. 109. a) (b) (c) (d) (d) CS32−CS32− comprises three regions of electron density (all are bonds without single pairs), the shape is trigonal planar; CS2 has only two regions of electron density (all bindings without single pairs); form is linear111. The lewis structure is made of three units, but the atoms must be rearranged: 113. The molecular dipole points away from the hydrogen atoms. 115. The structures are very similar. In model mode, each electron group occupies the same amount of space, so the binding angle is displayed as 109.5°. In the correct position, the single pairs are larger, which causes the hydrogen to be compressed. This leads to the smaller angle of 104.5°. Brainscape uses an adaptive learning algorithm that we call Confidence-Based Repetition. Our platform is scientifically proven to help you learn faster and remember longer. the distance between two consecutive peaks or valleys -measured in meters -also measured in nanometers nanometers

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