Chapter 6 chemistry test answer key

1. The spectrum shall consist of coloured lines, at least one of which (probably the brightest) is red.5. 3,233 ×× 10-19 J; 2.018 eV7. ν = 4,568 ×× 1014 s; λ = 656,3 nm; Energy mol−1 = 1,823 ×× 105 J mol−1; Red. (a) λ = 8,69 ×× 10–7 m; E = 2,29 ×× 10–19 J; b) λ = 4,59 ×× 10–7 m; E = 4,33 ×× 10–19 J; Colour (a) is red; (b) is blue.11. E = 9,502 ×× 10-15 J; ν = 1,434 ×× 1019 s-113. Red: 660 nm; 4,54 ×× 1014 Hz; 3.01 ×× 10-19 J. Green: 520 nm; 5,77 ×× 1014 Hz; 3.82 ×× 10-19 J. Blue: 440 nm; 6,81 ×× 1014 Hz; 4.51 ×× 10-19 J. Slightly different numbers are also possible.17. Quantified energy means that electrons can only have certain discrete energy values; values between these quantified values are not allowed.29. Both involve a relatively heavy core with electrons moving around it, although strictly speaking, the Bohr model only works for single-electron atoms or ions. According to classical mechanics, the Rutherford model predicts a miniature solar system with electrons moving around the core in circular or elliptical orbits that are limited to aircraft. If the requirements of the classical electromagnetic theory that electrons in such orbits would emit electromagnetic radiation are ignored, such atoms would be stable, with constant energy and angular pulse, but would not emit any visible light (as opposed to observation). If classical electromagnetic theory is used, then Rutherford's atom emits electromagnetic radiation at constantly increasing frequencies (as opposed to observed discrete spectra), thereby losing energy until the atom does not jump in an absurdly short time (as opposed to the observed long-term stability of atoms). The Bohr retains a classic mechanical view of circular orbits limited to planes with constant energy and angular momentum, but limits them to quantum values dependent on a single quantum number n. It is believed that the orbiting electron in the Bohr model does not emit any electromagnetic radiation when moving around the nucleus in its stationary orbits, but the atom can emit or absorb electromagnetic radiation when the electron changes from one orbit to another. In view of the quantified orbits, such quantum leaps will produce discrete spectra in agreement with observations.31. Both models have a centrally positively charged core with electrons moving around the core in accordance with coulomb electrostatic potential. The Bohr model assumes that electrons move in circular orbits that have quantified energies, angular momentum and radii that are specified by a single quantum number, n=1, 2, 3,..., but this quantification is an ad hoc assumption that Bohr has made to incorporate quantification into the essentially classic description of the atom of mechanics. Bohr also assumed that electrons orbiting the core usually electromagnetic radiation, but do so when the electron switches to another orbit. In a quantum mechanical model, electrons do not move in precise orbits (such orbits violate the Heisenberg uncertainty principle) and instead use a probability interpretation of the electron position at a given moment with a mathematical function called ψ wave function that can be used to determine the spatial distribution of the probability of an electron. These wave functions or orbitals are three-dimensional stationary waves that can be specified by three quantum numbers that naturally result from their basic mathematics (no ad hoc assumptions are needed): the main quantum number n (the same one used by Bohr) that specifies the shells so that orbits that have the same n all have the same energy and approximately the same spatial range; the quantum angular momentum number l, which is a measure of the angular momentum of the orbit and corresponds to the total shapes of the orbits, as well as specifies the subshelles so that orbits with the same l (and n) have the same energy; (a) the indicative quantum number m, which is a measure of the angular momentum component and corresponds to the orientation of the orbitals. Bohr model gives the same expression for energy as quantum mechanical expression, and therefore, as a proper account for hydrogen discrete spectrum (an example of getting the right answers for the wrong reasons, something that many chemistry students may sympathize with), but gives the wrong expression for angular momentum (Bohr circulate inevitably all have non-zero angular momentum, but some quantum orbitals [with orbitals] may have zero angular dynamics).33.n specifies the general range for energy value and likely distances which electron can be from the nucleus. I'm determining the shape of the orbit. m1 specifies the orientation of the orbits of the same value l in relation to each other. ms determines the rotation of the electron.35. 37. 39. 41. (a) x 2, y. 2, of 2; (b) x 1, y. 3, z. 0; (c) x 4 0 0 12,12, y. 2 1 0 12,12, z. 3 2 0 12;12; (d) x 1, y. 2, z. 3; e x. l = 0, ml = 0, y. l = 1, ml = –1,0 or +1, z. l = 2, ml = –2, –1, 0, +1, +245. n l ml with 4 0 0 +12+12 4 0 0 −12−12 4 1 −1 +12+12 4 1 0 +12+12 4 1 +1 +12+12 4 1 −1 −12−12 47. For example, Na+: 1s22s22p6; Ca2+: 1s22s22p63s23p6; Sn2+: 1s22s22p63s23p63d104s24p64d105s2; F–: 1s22s22p6; O2-: 1s22s22p6; Cl-: 1s22s22p63s23p6.49. (a) 1s22s22p3; b) 1s22s22p63s23p2; c) 1s22s22p63s23p64s23d6; d) 1s22s22p63s23p64s23d104p65s24d105p4; e) 1s22s22p63s23p64s23d104p65s24d105p66s24f951. 53. (a) (b) (c) (d) (e)59. Although both (b) and (c) are correct, (e) they include both and are the best answer.63. 1s22s22p63s23p63d104s24p64d105s25p66s24f145d1065. Co has 27 protons, 27 electrons and 33 neutrons: I have 53 protons, 53 electrons and 78 neutrons: 1s22s22p63s23p63d104s24p64d105s25p5.77. 81. Thank you for your participation! Thank you for your participation! Electrons, Atoms, Atom, Covalent, Ions, Ions, Octete, Valence, Electron, Orbitals, Www.sheffieldschools.org Chemistry-Chapter 6 Practice Test Test

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