Name Starman key Date Class

5 ELECTRONS IN ATOMS

Chapter Quiz

Classify each of these statements as always true, AT; sometimes true, ST; or never true, NT.

ST 1. The orbitals of a principal energy level are lower in energy than the orbitals in the next higher principal energy level. *5.1*

NT 2. The configuration $3d^4 4s^2$ is more stable than the configuration $3d^5 4s^1$. *5.2*

AT 3. In the quantum mechanical model of the atom, the probability of finding an electron within a certain volume of space surrounding the nucleus can be portrayed as a fuzzy cloud. *5.3*

ST 4. The fourth principal energy level of an atom contains 32 electrons. *5.1*

AT 5. There are five orbitals in the 4*d* energy level. *5.1*

NT 6. The amplitude of a wave is the distance between the crests. *5.3*

Fill in the word(s) that will make each statement true.

7. In the equation $E = h \times \nu$, h is called __7__. 7. Planck's constant *5.3*

8. The electron in a hydrogen atom has the least energy in the __8__. 8. ground state *5.3*

9. Einstein proposed that light is composed of particle-like quanta of energy; light quanta are known as __9__. 9. photons *5.3*

10. The __10__ effect occurs when light above the threshold frequency strikes a metal. 10. photoelectric *5.3*

11. De Broglie developed the idea that matter in motion exhibits __11__ properties. 11. wave like *5.3*

1s
2s 2p
3s 3p 3d
4s 4p 4d 4f ← 2+6+10+14 = 32
5s 5p 5d 5f
6s 6p 6d 6f
7s 7p 7d 7f

Name Date Class

5 ELECTRONS IN ATOMS

Vocabulary Review

Choose the term from the following list that best matches each description.

quantum
photons
hertz
Pauli exclusion principle
wavelength
Hund's rule
atomic emission spectrum
photoelectrons
Aufbau principle
quantum mechanical model

1. The lowest-energy arrangement of electrons in a subshell is obtained by putting electrons into separate orbitals of the subshell before pairing electrons.
Hund's rule

2. packets/quanta of electromagnetic energy
photons

3. the SI unit of frequency
hertz

4. An atomic orbital can hold no more than two electrons.
Pauli exclusion principle

5. the amount of energy required to move an electron from its present energy level to the next higher one
quantum

6. the modern description of the location and energy of electrons in an atom
quantum mechanical model

7. This principle states that electrons enter orbitals of lowest energy first.
Aufbau principle

8. the distance between two adjacent crests of an electromagnetic wave
wavelength

9. This is produced by passing the light emitted by an element through a prism.
atomic emission spectrum

10. These are sometimes produced when light shines on metals.
photoelectrons ← don't worry about