Chapter 4

1. On a periodic chart of the elements, when would the next atom listed move to the next row or

“period”?

a. when another proton is added

b. when the next electron added requires a new shell

c. when the atomic weight changes

d. when the next isotope is reached

2. The smallest unit of a chemical compound is the:

a. electron

b. nucleus

c. atom

d. molecule

e. proton

3. The barium sulfate suspension which patients drink for an Upper GI series is chemically best

described as a(n):

a. element

b. compound

c. mixture

d. molecule

e. sustenance

4. The strongest type of bonding of atoms together to form molecules is:

a. Van Der Whals forces

b. ionic bonding

c. covalent bonding

d. magnetic bonding

e. James Bonding

5. Superman’s gas, Krypton, has 36 electrons arranged in 4 “shells.” How many electrons can it

hold in its “M” shell:

a. 2

b. 4

c. 8

d. 16

e. 18

6. Which of the following must be changed in an atom in order to change the identity of the

element?

a. Z number

b. A number

c. N number

d. valence

e. charge

For numbers 7-9 use the following list:

a. C

b. T

c. W

d. O

e. Ca

7. From the above list, what is the chemical symbol for oxygen?

8. From the above list, what is the chemical symbol for calcium?

9. From the above list, what is the chemical symbol for tungsten?

For numbers 10-12 use the following list:

a. 6

b. 8

c. 20

d. 47

e. 74

10. From the above list, what is the atomic number for oxygen?

11. From the above list, what is the atomic number for calcium?

12. From the above list, what is the atomic number for tungsten?

For numbers 13-15 use the following list:

a. B

b. Ba

c. L

d. Pb

e. I

13. From the above list, what is the chemical symbol for iodine?

14. From the above list, what is the chemical symbol for barium?

15. From the above list, what is the chemical symbol for lead?

For numbers 16-18 use the following list:

a. 47

b. 53

c. 56

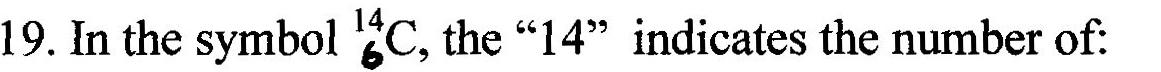
d. 82

e. 92

16. From the above list, what is the atomic number for iodine?

17. From the above list, what is the atomic number for barium?

18. From the above list, what is the atomic number for lead?



a. protons

b. neutrons

c. nucleons

d. electrons

e. photons

20. If an atom has 20 neutrons, 20 protons and 19 electrons, it is:

a. unstable

b. an ion

c. an isotope

d. covalent

e. radioactive

21. An isotope is an atom which has:

a. an electrical charge

b. excess energy

c. an unusual number of nucleons

d. an unusual number of neutrons

e. radioactivity

22. Which of the following is *not* a form of naturally occurring radiation from radioactive nuclei:

a. alpha particles

b. beta particles

c. gamma rays

d. x-rays

e. all of these are forms of natural radiation

23. Beta particles can be emitted from:

a. any nucleon

b. any neutron

c. any proton

d. any electron

e. any quark

24. Our sun forces hydrogen nuclei together to form helium nuclei. This is called:

a. ionization

b. fission

c. fusion

d. radioactivity

e. combustion

25. The outermost “shell” of an atom can *never* hold more than electrons in it:

a. 2N2

b. 8

c. 18

d. 2

e. its principle quantum number

26. In the most accurate depiction of an atom, the electrons are held within distinct volumes of

space with various shapes, called:

a. “nucleons”

b. “shells”

c. “orbits”

d. “orbitals”

e. “valence volumes”

27. How many *elements* are in LaSO4 ?

a. one

b. two

c. three

d. four

e. six

28. When an alpha particle is emitted from an atom of uranium, how does this change the atomic

*mass* ?

a. it increases by one

b. it decreases by one

c. it decreases by two

d. it increases by four

e. it decreases by four

29. The vertical columns in the periodic table of the elements are called:

a. valence

b. groups

c. periods

d. principle quantum numbers

e. isotopes

30. Compared to an electron, how much more massive is a proton?

a. about the same

b. 10 times more

c. one-tenth

d. 2000 times more

e. 2000 times less

31. Within each shell of an atom, which of the two rules for electron configuration always takes

precedence?

a. the octet rule

b. the 2N2 rule

c. the principle quantum number rule

d. the valence rule

e. the electrical balance rule

32. Covalent bonding between atoms occurs because of a “defect” in the:

a. balance between protons and electrons

b. balance between protons and neutrons

c. atomic weight

d. distribution of positive charge within the nucleus

e. distribution of negative charge that forms a smooth screen around the atom

33. In the anode of an x-ray tube, what do incoming projectile electrons do to atoms in the disc:

a. cause them to become unstable

b. ionize them

c. give them a negative electrical charge

d. cause them to transmutate into isotopes

e. cause them to fission

34. When gamma radiation is emitted from a radioactive atom, what happens to the atom’s *Z*

number?

a. it remains unchanged

b. it decreases by one

c. it decreases by two

d. it increases by four

e. it decrease by four

35. The lowest energy level possible for a particular atomic nucleus is called its:

a. stable state

b. neutral state

c. ground state

d. valence state

e. minimal state

36. What are the two differences between alpha particles and beta particles?

a. mass and charge

b. charge and velocity

c. velocity and energy

d. all of the above

e. none of the above

37. The difference between beta particles and orbital electrons include:

a. origin

b. energy

c. velocity

d. all of the above

e. none of the above

38. For a particular element, *all* isotopes of the element have the same:

a. number of protons

b. potential energy

c. net force

d. equilibrium

e. number of neutrons

39. If the number of protons within an atom’s nucleus is changed, which of the following must

absolutely change:

a. the number of electrons

b. the number of neutrons

c. the element’s name

d. the electrical charge

40. As a result of Beta decay, an atom *gains*:

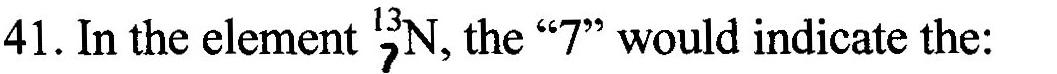
a. an electron

b. a proton

c. a neutron

d. a photon

e. weight



a. atomic number

b. atomic weight

c. atomic mass

d. neutron number

e. electrical charge

42. The “principle quantum number” of an atom is related to:

a. the energy a quantum (photon) must have to knock out a k-shell electron

b. the total number of electrons in the shells

c. the number of electrons in the outermost shell

d. the total number of nucleons in the nucleus

e. the horizontal row it belongs to on the periodic chart of elements

43. The mass number “A” of an element is equal to the:

a. number of protons in the nucleus

b. number of protons orbiting the nucleus

c. number of neutrons in the nucleus

d. number of nucleons in the nucleus

e. number of electrons in the nucleus

44. Which of the following elements has a Z number of 53:

a. calcium

b. tungsten

c. iodine

d. lead

e. carbon dioxide

45. Which of the following elements has 82 protons in its nucleus:

a. oxygen

b. carbon

c. barium

d. lead

e. uranium

46. When held together by a force created by a difference in electrical potential, two atoms

experience:

a. Van Der Wahls forces

b. covalent bonding

c. ionic bonding

d. magnetic bonding

e. electromagnetic bonding

47. The third “shell” outward from the nucleus of an atom can never, under any circumstances,

hold more than electrons:

a. 2

b. 4

c. 8

d. 16

e. 18

48. On the periodic chart of the elements, when would the next atom listed move to the next

*group*?

a. when another proton is added

b. when the next electron added requires a new “shell”

c. any time the atomic weight changes

d. when the next isotope is reached

49. Which of the following forces is responsible for the fact that objects seem solid even though

atoms are mostly space?

a. gravitational

b. strong nuclear

c. weak nuclear

d. electrical

e. centripetal

50. An atom has a A-number of 30 and 12 neutrons in its nucleus. What is its *Z* number?

a. 30

b. 42

c. 18

d. 12

51. 131I (iodine 131) decays into 131Xe (xenon 131). The disintegration of 131I must

consist of a(n):

1. alpha particle
2. beta particle
3. gamma ray
4. x-ray

52. What is the term that describes a change of elements due to radioactivity?

a. transmutation

b. neutron decay

c. disintegration

d. ionization