Ch.Q1W2-H.W

Multiple Choice

Identify the choice that best completes the statement or answers the question.

1. The first subatomic particle discovered was the _ a. proton c. electron b. neutron d. nucleus 2. The scientific statement that says that compounds always have exactly the same composition by mass is the a. atomic theory c. law of conservation of matter b. matter hypothesis d. law of definite proportions 3. When a hypothesis is tested by many experiments, it becomes a(n) _____. a. scientific law c. theory b. revised hypothesis d. experimental fact 4. The only subatomic particle that does not carry an electric charge is the c. electron a. proton b. neutron d. nucleus 5. The atomic number of an element whose atoms have 9 protons and 10 neutrons is _____. a. 9 c. 10 b. 19 d. 18 6. The mass number of an element whose atoms have 12 protons and 13 neutrons is _____. a. 12 c. 25 b. 13 d. 12.5 7. One isotope of carbon has 6 protons and 6 neutrons. The number of protons and neutrons of a second isotope of carbon would be _____. a. 7 and 6 c. 7 and 7 b. 6 and 7 d. 6 and 6 8. The correct way to arrange the three forms of electromagnetic radiation listed below, from highest to lowest frequency, is . a. ultraviolet > visible > infrared c. infrared > visible > ultraviolet b. visible > ultraviolet > infrared d. infrared > ultraviolet > visible _ first proposed that matter is made up of atoms, the smallest particles of matter. 9. a. Democritus c. Proust b. Lavoisier d. Dalton 10. According to the law of conservation of matter, if 4.0 g of hydrogen react with chlorine to produce 146 g of hydrogen chloride, how many grams of chlorine reacted? a. 4.0 g c. 146 g b. 142 g d. 150 g 11. If 9.0 g of water contain 1.0 g of hydrogen, what mass of oxygen is contained in 36 g of water? a. 4.0 g c. 10.0 g b. 8.0 g d. 32 g 12. Which of the following statements is not a main point of Dalton's atomic theory? a. All matter is made up of atoms. b. Atoms are made up of smaller particles. c. Atoms are indestructible. d. All atoms of one element are exactly alike, but they are different from atoms of other elements.

 13.	J.J. Thomson used a cathode ray to discover th	e	
	a. atom	c.	proton
	b. electron	d.	neutron
 14.	If a scientist studies a beam of particles, and th particles are most likely	ose	particles are attracted to a negatively charged plate, the
	a. atoms	c.	protons
	b. electrons	d.	neutrons
 15.	What is a good comparison of the charge of an	elec	tron and the charge of a proton?
	a. They are equal, but opposite.	c.	They are the same.
	b. The charge of the electron is larger.	d.	The charge of the proton is larger.
 16.	Iodine-131 and iodine-127 are examples of		
	a. nuclei	c.	isotopes
	b. isomers	d.	neutrons
17.	The discovery of isotopes led to the discovery	of	
	a. atoms	c.	protons
	b. electrons	d.	neutrons
18.	The experimentation of led to the theory	/ tha	t the atom is a sphere of mostly empty space, with a
	positively charged nucleus with electrons around	nd it	
	a. Bohr	c.	Rutherford
	b. Nagaoka	d.	Thomson
19.	Which of the following are definitely in atoms	of tl	he same element?
	a. 3 protons, 3 neutrons and 3 protons, 4 neut	rons	
	b. 3 protons, 3 neutrons and 4 protons, 4 neut	rons	
	c. 4 protons, 4 neutrons and 3 protons, 4 neut	rons	
	d. 3 protons, 4 neutrons and 4 protons, 3 neut	rons	
 20.	Atomic mass units are based on the mass of an	ator	m of
	a. carbon-12	c.	oxygen-16
	b. carbon-14	d.	nitrogen-14
 21.	The is where the electron is most likely	to b	e found.
	a. energy level	c.	electron cloud
	b. electron orbit	d.	orbit
 22.	An atom of iron contains 26 electrons. How ma	any	energy levels are needed to contain these electrons?
	a. 1	c.	3
	b. 2	d.	4
 23.	The atomic number of chlorine is 17. How man	ny va	alence electrons does an atom of chlorine have?
	a. 2	c.	8
	b. 7	d.	17
 24.	In a Lewis dot diagram, the dots represent	ir	the atom.
	a. all the electrons	c.	the protons
	b. the valence electrons	d.	the neutrons

Short Answer

25. The Sequence of a scientific method is:a. experiment, hypothesis, observation, revised hypothesis, theory.b. observation, hypothesis, experiment, revised hypothesis, theoryc. hypothesis, observation, experiment, revised hypothesis, theoryd. theory, observation, hypothesis, experiment, revised hypothesis

- 26. An atom of tin has atomic number of 50 and mass number of 119. How many protons, neutrons, and electrons does this atom of tin contain?
 - a. 50 protons, 69 neutrons, 50 electrons
 - b. 69 protons, 50 neutrons, 50 electrons
 - c. 50 protons, 50 neutrons, 69 electrons
 - d. 69 protons, 69 neutrons, 50 electrons
- 27. What is the atomic mass of hafnium if, out of every 100 atoms, 5 have mass 176, 19 have mass 177, 27 have mass 178, 14 have mass 179, and 35 have mass 180.0?
 - a. 158.55
 - b. 168.55
 - c. 178.55
 - d. 188.55

Problem

These three boxes shown in Figure 2-1 are taken from the periodic table. They represent elements that have no known isotopes. Use the information contained in these boxes to supply the information requested for the atoms of each element. For atomic structure, give the number of protons, neutrons, and electrons.





28.

Beryllium:	a. Mass number for this atom:	9	Atomic structure: $(4 p^+ + 5 n^0)$ and $4e^-$
	b. Mass number for this atom:	9	Atomic structure: $(4 p^+ + 5 n^0)$ and $4e^{-1}$
	c. Mass number for this atom:	4	Atomic structure: $(4 p^+ + 5 n^0)$ and $5e^-$
	d. Mass number for this atom:	4	Atomic structure: $(5 p^+ + 5 n^0)$ and $5e^{-1}$

29.

Scar	dium:	a. Mass number for this atom:	45	Atomic structure: $(21 p^+ + 24 n^0)$ and $21e^-$
		b. Mass number for this atom:	45	Atomic structure: $(24 p^+ + 21 n^0)$ and $21e$
		c. Mass number for this atom:	24	Atomic structure: $(21 p^+ + 24 n^0)$ and $21e^-$
		d. Mass number for this atom:	24	Atomic structure: $(45 p^+ + 24 n^0)$ and $45e$

30.

Manganese:a. Mass number for this atom:30Atomic structure: $(25 p^+ + 30 n^0)$ and 25^- b. Mass number for this atom:30Atomic structure: $(30 p^+ + 25 n^0)$ and 25^- c. Mass number for this atom:55Atomic structure: $(25 p^+ + 30 n^0)$ and 25^- d. Mass number for this atom:55Atomic structure: $(25 p^+ + 30 n^0)$ and 25^- d. Mass number for this atom:55Atomic structure: $(25 p^+ + 30 n^0)$ and 30^-

The diagram in Figure 2-2 represents a potassium atom. Answer the questions about the electron transitions that take place in this atom.



Figure 2-2

- 31. This atom has:
- a. It has 4 valence electron.
- b. It has 3 valence electron.
- c. It has 2 valence electron.
- d. It has 1 valence electron.
- 32. Suppose that a potassium atom absorbs energy that causes two electrons to move up to the fifth energy level: one from the fourth energy level and one from the third. In terms of emission spectra, what will happen when the electrons return to their original levels?

a. Each electron will release energy, but the one that falls back to the third level will release more energy. Two spectral lines of differing energy will therefore result.

b. Each electron will release energy, but the one that falls back to the third level will release less energy. Two spectral lines of differing energy will therefore result.

c. Each electron will release energy, but the one that falls back to the third level will release more energy. Three spectral lines of differing energy will therefore result.

d. Each electron will release energy, but the one that falls back to the third level will release more energy. Four spectral lines of differing energy will therefore result.

33. If enough energy was added to the atom to permit an electron to escape from the atom, which electron would it be?

a. The first electron to leave the atom would be one in the lowest energy level. It is least attracted to the nucleus

b. The first electron to leave the atom would be one in the highest energy level. It is least attracted to the nucleus

c. The first electron to leave the atom would be one in the lowest energy level. It is most attracted to the nucleus

d. The first electron to leave the atom would be one in the highest energy level. It is most attracted to the nucleus

This set of data is similar to those on which Joseph Louis Proust based his law of definite proportions in 1799. Answer these questions about these data and their interpretation.

Trial	Nitrogen Mass	Oxygen Mass
101	13.9 g	16.0 g
102	25.8 g	29.2 g
103	19.7 g	22.3 g
104	31.8 g	36.2 g

34. Calculate the percentage of nitrogen and oxygen for each of the four trials shown here.

a. 46.5, 53.5;	46.9, 53.1;	46.9, 53.1;	46.8, 53.2
b. 56.5, 53.5;	56.9, 53.1;	56.9, 53.1;	56.8, 53.2

35. How do the results of these experiments lead to the law of definite proportions?

a. The compound formed between nitrogen and oxygen had different proportion.

b. The compound formed between nitrogen and oxygen always has the same proportion.