

# Test Bank for Chemistry Atoms First 2nd Edition Burdge

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## Chapter 2 - Atoms and the Periodic Table (test bank)

Student: \_\_\_\_\_

1.

The scientist who determined the magnitude of the electric charge on the electron was

- A. John Dalton
- B. Robert Millikan
- C. J. J. Thomson
- D. Henry Moseley
- E. J. Burdge

2.

When J. J. Thomson discovered the electron, what physical property of the electron did he measure?

- A. its charge,  $e$
- B. its charge-to-mass ratio,  $e/m$
- C. its temperature,  $T$
- D. its mass,  $m$
- E. its atomic number,  $Z$

3.

Which field of study made a big contribution toward understanding the composition of the atom?

- A. Electricity
- B. Radiation
- C. Solution chemistry
- D. Electrochemistry
- E. Quantum mechanics

4.

Which of the following is a type of radioactive radiation that has no charge and is unaffected by external electric or magnetic fields?

- A. rays
- B. rays
- C. rays
- D. rays
- E. rays

5.

Which of the following is a type of radioactive radiation that consists of positively charged particles and is deflected away from the positively charged plate?

- A. rays
- B. rays
- C. rays
- D. rays
- E. rays

6.

Which of the following is a type of radioactive radiation that consists of electrons and is deflected away from the negatively charged plate?

- A. rays
- B. rays
- C. rays
- D. rays
- E. rays

7.

Which of these scientists developed the nuclear model of the atom?

- A. John Dalton
- B. Robert Millikan
- C. J. J. Thomson
- D. Henry Moseley
- E. Ernest Rutherford

8.

Rutherford's experiment with alpha particle scattering by gold foil established that

- A. protons are not evenly distributed throughout an atom.
- B. electrons have a negative charge.
- C. electrons have a positive charge.
- D. atoms are made of protons, neutrons, and electrons.
- E. protons are 1840 times heavier than electrons.

9.

J. J. Thomson studied cathode ray particles (electrons) and was able to measure the mass/charge ratio. His results showed that

- A. the mass/charge ratio varied as the cathode material was changed.
- B. the charge was always a whole-number multiple of some minimum charge.
- C. matter included particles much smaller than the atom.
- D. atoms contained dense areas of positive charge.
- E. atoms are largely empty space.

10.

Who is credited with measuring the mass/charge ratio of the electron?

- A. Dalton
- B. Chadwick
- C. Thomson
- D. Millikan
- E. Rutherford

11.

Who is credited with first measuring the charge of the electron?

- A. Dalton
- B. Gay-Lussac
- C. Thomson
- D. Millikan
- E. Rutherford

12.

Millikan's oil-drop experiment

- A. established the charge on an electron.
- B. showed that all oil drops carried the same charge.
- C. provided support for the nuclear model of the atom.
- D. suggested that some oil drops carried fractional numbers of electrons.
- E. suggested the presence of a neutral particle in the atom.

13.

Who is credited with discovering the atomic nucleus?

- A. Dalton
- B. Gay-Lussac
- C. Thomson
- D. Chadwick
- E. Rutherford

14.

Rutherford bombarded gold foil with alpha (  $\alpha$  ) particles and found that a small percentage of the particles were deflected. Which of the following was not accounted for by the model he proposed for the structure of the atom?

- A. the small size of the nucleus
- B. the charge on the nucleus
- C. the total mass of the atom
- D. the existence of protons
- E. the presence of electrons outside the nucleus

15.

Which one of the following statements about atoms and subatomic particles is correct?

- A. Rutherford discovered the atomic nucleus by bombarding gold foil with electrons
- B. The proton and the neutron have identical masses.
- C. The neutron's mass is equal to that of a proton plus an electron.
- D. A neutral atom contains equal numbers of protons and electrons.
- E. An atomic nucleus contains equal numbers of protons and neutrons.

16.

Who discovered the neutron, the subatomic particle having a neutral charge?

- A. Millikan
- B. Dalton
- C. Chadwick
- D. Rutherford
- E. Thomson

17.

What is the term for the number of protons in the nucleus of each atom of an element? It also indicates the number of electrons in the atom.

- A. Isotope number
- B. Mass number
- C. Mass-to-charge ratio
- D. Atomic number
- E. Atomic mass units

18.

What is the term for the total number of neutrons and protons in the nucleus of each atom of an element?

- A. Isotope number
- B. Mass number
- C. Mass-to-charge ratio
- D. Atomic number
- E. Atomic mass units

19.

Bromine is the only nonmetal that is a liquid at room temperature. Consider the isotope bromine-81,  ${}_{35}^{81}\text{Br}$ . Select the combination which lists the correct atomic number, number of neutrons, and mass number, respectively.

- A. 35, 46, 81
- B. 35, 81, 46
- C. 81, 46, 35
- D. 46, 81, 35
- E. 35, 81, 116

20.

Atoms X, Y, Z, and R have the following nuclear compositions:



I

II

III

IV

Which of the following are isotopes of the same element?

- A. I&II
- B. I&IV
- C. II&IV
- D. III & IV
- E. I&III

21.

Which isotope is *not* possible?

- A.  ${}_{1}^{1}\text{H}$
- B.  ${}_{1}^{2}\text{H}$
- C.  ${}_{24}^{52}\text{Cr}$
- D.  ${}_{25}^{25}\text{Mn}$
- E. All of these isotopes are possible.



22.

The principal factor that determines whether a nucleus is stable is the

- A. electron-to-neutron ratio.
- B. electron-to-proton ratio.
- C. neutron-to-proton ratio.
- D. chemical family.
- E. number of electrons.

23.

Which of the following is not a magic number?

- A. 20
- B. 10
- C. 126
- D. 82
- E. 2

24.

Which combination of neutrons and protons leads to the most number of stable nuclei?

- A. Odd number of neutrons and odd number of protons
- B. Even number of neutrons and odd number of protons
- C. Odd number of neutrons and even number of protons
- D. Even number of neutrons and even number of protons
- E. None of the options above results in significantly more stable nuclei.

25.

As the number of protons increases, stable nuclei will

- A. have an equal number of neutrons and protons.
- B. have an increased ratio of neutrons to protons.
- C. have an odd number of neutrons.
- D. have an decreased ratio of neutrons to protons.
- E. become the most common type of nuclei.

26.

Atoms of the same element with different mass numbers are called

- A. ions.
- B. neutrons.
- C. chemical groups.
- D. chemical families.
- E. isotopes.

27.

How many neutrons are there in an atom of lead whose mass number is 208?

- A. 82
- B. 126
- C. 208
- D. 290
- E. none of them

28.

An atom of the isotope sulfur-31 consists of how many protons, neutrons, and electrons? (p = proton, n = neutron, e = electron)

- A. 15 p, 16 n, 15 e
- B. 16 p, 15 n, 16 e
- C. 16 p, 31 n, 16 e
- D. 32 p, 31 n, 32 e
- E. 16 p, 16 n, 15 e

29.

Give the number of protons (p), electrons (e), and neutrons (n) in one atom of chlorine-37.

- A. 37 p, 37 e, 17 n
- B. 17 p, 17 e, 37 n
- C. 17 p, 17 e, 20 n
- D. 37 p, 17 e, 20 n
- E. 17 p, 37 e, 17 n

30.

Two isotopes of an element differ only in their

- A. symbol.
- B. atomic number.
- C. atomic mass.
- D. number of protons.
- E. number of electrons.

31.

The elements in a column of the periodic table are known as

- A. metalloids.
- B. a period.
- C. noble gases.
- D. a group.
- E. nonmetals.

32.

Which of these materials are usually poor conductors of heat and electricity?

- A. Metals
- B. Metalloids
- C. Nonmetals
- D. Alkaline earth metals
- E. Alkali metals

33.

Which of these elements is most likely to be a good conductor of electricity?

- A. N
- B. S
- C. He
- D. Cl
- E. Fe

34.

Which of the following elements are the least reactive?

- A. Alkali metals
- B. Noble gases
- C. Halogens
- D. Alkaline earth metals
- E. Metalloids

35.

Which of the following is a nonmetal?

- A. Lithium, Li,  $Z = 3$
- B. Bromine, Br,  $Z = 35$
- C. Mercury, Hg,  $Z = 80$
- D. Bismuth, Bi,  $Z = 83$
- E. Sodium, Na,  $Z = 11$

36.

Which of the following is a metal?

- A. Nitrogen, N,  $Z = 7$
- B. Phosphorus, P,  $Z = 15$
- C. Arsenic, As,  $Z = 33$
- D. Thallium, Tl,  $Z = 81$
- E. Silicon, Si,  $Z = 14$

37.

Which of the following is a metalloid?

- A. Carbon, C,  $Z = 6$
- B. Sulfur, S,  $Z = 16$
- C. Germanium, Ge,  $Z = 32$
- D. Iridium, Ir,  $Z = 77$
- E. Bromine, Br,  $Z = 35$

38.

A row of the periodic table is called a(n)

- A. group.
- B. period.
- C. isotopic mixture.
- D. family.
- E. subshell.

39.

Silicon, which makes up about 25% of Earth's crust by mass, is used widely in the modern electronics industry. It has three naturally occurring isotopes,  $^{28}\text{Si}$ ,  $^{29}\text{Si}$ , and  $^{30}\text{Si}$ . Calculate the atomic mass of silicon.

Isotope	Isotopic Mass (amu)	Abundance %
$^{28}\text{Si}$	27.976927	92.22
$^{29}\text{Si}$	28.976495	4.69
$^{30}\text{Si}$	29.973770	3.09

- A. 29.2252 amu
- B. 28.9757 amu
- C. 28.7260 amu
- D. 28.0855 amu
- E. 27.9801 amu

40.

Lithium forms compounds which are used in dry cells, storage batteries, and in high-temperature lubricants. It has two naturally occurring isotopes,  ${}^6\text{Li}$  (isotopic mass = 6.015123 amu) and  ${}^7\text{Li}$  (isotopic mass = 7.016005 amu). Lithium has an atomic mass of 6.9412 amu. What is the percent abundance of lithium-6?

- A. 92.53%
- B. 86.65%
- C. 49.47%
- D. 7.47%
- E. 6.015%

41.

In the periodic table, atoms are arranged in order of

- A. increasing atomic mass.
- B. increasing atomic number.
- C. physical properties.
- D. periodicity.
- E. chemical reactivities.

42.

The elements in Group 7A are known by what name?

- A. Transition metals
- B. Halogens
- C. Alkali metals
- D. Alkaline earth metals
- E. Noble gases

43.

The elements in Group 2A are known by what name?

- A. Transition metals
- B. Halogens
- C. Alkali metals
- D. Alkaline earth metals
- E. Noble gases

44.

The alkali metal elements are found in \_\_\_\_\_ of the periodic table.

- A. Group 1A
- B. Group 2A
- C. Group 3A
- D. Period 7
- E. Period 1

45.

What term defines a mass which is exactly equal to 1/12 the mass of one carbon-12 atom?

- A. Isotope number
- B. Mass number
- C. Mass-to-charge ratio
- D. Atomic number
- E. Atomic mass unit



46.

Which of these elements is chemically similar to magnesium?

- A. Sulfur
- B. Calcium
- C. Iron
- D. Nickel
- E. Potassium

47.

Which of these elements is chemically similar to oxygen?

- A. Sulfur
- B. Calcium
- C. Iron
- D. Nickel
- E. Potassium

48.

Which of these elements is chemically similar to potassium?

- A. calcium
- B. arsenic
- C. phosphorus
- D. cerium
- E. cesium

49.

How many atoms are in 0.534 mol of nickel, Ni?

- A.  $1.13 \times 10^{24}$  atoms
- B.  $1.48 \times 10^{25}$  atoms
- C.  $2.44 \times 10^{22}$  atoms
- D.  $3.22 \times 10^{23}$  atoms
- E.  $6.98 \times 10^{21}$  atoms

50.

How many atoms are in 7.12 mol of gold, Au?

- A.  $1.18 \times 10^{-23}$  atoms
- B.  $4.29 \times 10^{24}$  atoms
- C.  $8.46 \times 10^{22}$  atoms
- D.  $4.70 \times 10^{24}$  atoms
- E.  $3.34 \times 10^{26}$  atoms

51.

How many moles are in  $8.73 \times 10^{25}$  atoms of boron, B?

- A. 145 moles
- B.  $3.84 \times 10^{27}$  moles
- C. 1.45 moles
- D.  $5.04 \times 10^{-25}$  moles
- E.  $6.90 \times 10^{-3}$  moles

52.

How many moles are present in 17.4 g of lead?

- A. 0.0994 moles
- B.  $1.05 \times 10^{25}$  moles
- C. 0.0840 moles
- D. 10.06 moles
- E. 11.9 moles

53.

How many grams are present in 0.885 moles of manganese?

- A. 62.1 g
- B. 48.6 g
- C. 21.5 g
- D. 27.5 g
- E. 0.016 g

54.

Determine the mass of hydrogen (in grams) that contains  $5.08 \times 10^{15}$  hydrogen atoms.

- A.  $5.12 \times 10^{15}$  g
- B.  $3.06 \times 10^{39}$  g
- C.  $3.06 \times 10^{-9}$  g
- D.  $8.50 \times 10^{-9}$  g
- E.  $8.5 \times 10^{15}$  g

55.

What element is represented by X in the atomic symbol notation  ${}_{78}^{195}\text{X}$ ?

- A. Iridium
- B. Platinum
- C. Palladium
- D. Selenium
- E. Magnesium

56.

A rock contains an element with a molar mass of 40.08 g/mol. If  $9.28 \times 10^{24}$  atoms of this element were found in the rock, how many grams of the unknown element are present in the rock?

- A. 618 g
- B.  $1.49 \times 10^{28}$  g
- C.  $2.24 \times 10^{50}$  g
- D. 0.38 g
- E. 3.80 g

57.

Five vials each contain 12 grams of a solid metal sample. The samples include calcium, platinum, barium, gold, and silver. Which vial has the most metal atoms?

- A. Calcium
- B. Barium
- C. Gold
- D. Silver
- E. Platinum

58.

Five vials each contain 12 grams of a solid metal sample. The samples include calcium, platinum, barium, gold, and silver. Which vial has the fewest moles of metal atoms?

- A. Calcium
- B. Barium
- C. Gold
- D. Silver
- E. Platinum

59.

Determine the number of electrons and identify the correct symbol for an atom with 17 protons and 18 neutrons.

- A. 17 electrons,  ${}_{17}^{35}\text{Cl}$
- B. 18 electrons,  ${}_{18}^{36}\text{Ar}$
- C. 17 electrons,  ${}_{17}^{18}\text{Cl}$
- D. 17 electrons,  ${}_{35}^{17}\text{Cl}$
- E. 18 electrons,  ${}_{36}^{18}\text{Ar}$

60.

Determine the number of protons, electrons, and neutrons for the isotope gold-118. The symbol for gold is Au.

- A. 118 protons, 118 electrons, 79 neutrons
- B. 79 protons, 79 electrons, 118 neutrons
- C. 79 protons, 79 electrons, 39 neutrons
- D. 118 protons, 118 electrons, 39 neutrons
- E. 79 protons, 39 electrons, 118 neutrons

61.

Determine the number of protons and identify the correct symbol for an atom with 20 neutrons and 20 electrons.

- A. 20 protons,  ${}_{20}^{20}\text{Ca}$
- B. 20 protons,  ${}_{20}^{40}\text{Ca}$
- C. 20 protons,  ${}_{40}^{20}\text{Ca}$
- D. 40 protons,  ${}_{20}^{40}\text{Ca}$
- E. 40 protons,  ${}_{40}^{20}\text{Ca}$

62.

The mass of a neutron is equal to the mass of a proton plus the mass of an electron.

True False

63.

All neutral atoms of tin have 50 protons and 50 electrons.

True False

64.

Copper (Cu) is a transition metal.

True False

65.

Lead (Pb) is a main group element.

True False

66.

Almost all the mass of an atom is concentrated in the nucleus.

True False

67.

When a beam of alpha particles passes between two electrically charged plates, the beam is deflected toward the positive plate.

True False

68.

J. J. Thomson suggested the term "radioactivity" to describe the spontaneous emission of particles and/or radiation.

True False

69.

The elements in Group 8A are called the\_\_\_\_\_.

---

70. The elements in Group 2A are called the\_\_\_\_\_.

---

71.

The elements in Group 7A are called the\_\_\_\_\_.

---

72.

The elements in Group 1A are called the\_\_\_\_\_.

---

73.

\_\_\_\_\_ is the emission and transmission of energy through space in the form of waves.

---

74.

\_\_\_\_\_ is the negatively charged plate connected to a high-voltage source.

---

75.

\_\_\_\_\_ are electrons that are deflected away from negatively charged plates.

---

76.

\_\_\_\_\_ are atoms that have the same atomic number ( $Z$ ) but different mass numbers ( $A$ ).

---



77.

\_\_\_\_\_ have properties that are intermediate between those of metals and nonmetals.

\_\_\_\_\_

78.

The elements in Group 8A are called the \_\_\_\_\_.

\_\_\_\_\_

79.

\_\_\_\_\_ is defined as a mass exactly equal to one-twelfth the mass of one carbon-12 atom.

\_\_\_\_\_

80.

A mole is the amount of a substance that contains \_\_\_\_\_ of elementary particles (atoms, molecules, etc.).

\_\_\_\_\_

81.

What is the name given for the elements in Group 1A in the periodic table?

82.

What is the name given for the elements in Group 7A in the periodic table?

83.

Which group is given the name chalcogens?

84.

What are the three types of radiation produced by the decay of substances like uranium?

85.

The table below describes four atoms.

	Atom A	Atom B	Atom C	Atom D
Number of protons	79	80	80	79
Number of neutrons	118	120	118	120
Number of electrons	79	80	80	79

Which atoms represent the same element?

86.

In the early 1900s, Ernest Rutherford performed an experiment with thin foils of gold and alpha particles to probe the structure of the atoms. He observed that most of these alpha particles penetrated the foil and were not deflected. Realizing that atoms are electrically neutral (that is, they have equal numbers of protons and electrons) and that the mass of a proton is significantly greater than the mass of an electron, use Rutherford's data to propose a structural model of an atom.

87.

State the two important experimental results (and the names of the responsible scientists) which enabled the mass of the electron to be determined.

88.

Determine the average atomic mass of boron. The natural abundance of  $^{10}\text{B}$  (weighing 10.0129 amu) is 19.9% and the natural abundance of  $^{11}\text{B}$  (weighing 11.0093 amu) is 80.1%. Show all your work.

## Chapter 2 - Atoms and the Periodic Table (test bank) **Key**

1.

The scientist who determined the magnitude of the electric charge on the electron was

- A. John Dalton
- B. Robert Millikan
- C. J. J. Thomson
- D. Henry Moseley
- E. J. Burdge

*Blooms: 1. Remember*

*Chapter - Chapter 2 #1*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

2.

When J. J. Thomson discovered the electron, what physical property of the electron did he measure?

- A. its charge,  $e$
- B. its charge-to-mass ratio,  $e/m$
- C. its temperature,  $T$
- D. its mass,  $m$
- E. its atomic number,  $Z$

*Blooms: 2. Understand*

*Chapter - Chapter 2 #2*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

3.

Which field of study made a big contribution toward understanding the composition of the atom?

- A. Electricity
- B. Radiation
- C. Solution chemistry
- D. Electrochemistry
- E. Quantum mechanics

*Blooms: 2. Understand*

*Chapter - Chapter 2 #3*

*Difficulty: Medium*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

4.

Which of the following is a type of radioactive radiation that has no charge and is unaffected by external electric or magnetic fields?

- A. rays
- B. rays
- C. rays
- D. rays
- E. rays

*Blooms: 2. Understand*

*Chapter - Chapter 2 #4*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

5.

Which of the following is a type of radioactive radiation that consists of positively charged particles and is deflected away from the positively charged plate?

- A. rays
- B. rays
- C. rays
- D. rays
- E. rays

*Blooms: 2. Understand*

*Chapter - Chapter 2 #5*

*Difficulty: Medium*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

6.

Which of the following is a type of radioactive radiation that consists of electrons and is deflected away from the negatively charged plate?

- A. rays
- B. rays
- C. rays
- D. rays
- E. rays

*Blooms: 2. Understand*

*Chapter - Chapter 2 #6*

*Difficulty: Easy*

*Subtopic: Atomic Theories*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

7.

Which of these scientists developed the nuclear model of the atom?

- A. John Dalton
- B. Robert Millikan
- C. J. J. Thomson
- D. Henry Moseley
- E. Ernest Rutherford

*Blooms: 1. Remember*

*Chapter - Chapter 2 #7*

*Difficulty: Easy*

*Subtopic: Atomic Theories*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

8.

Rutherford's experiment with alpha particle scattering by gold foil established that

A. protons are not evenly distributed throughout an atom.

B. electrons have a negative charge.

C. electrons have a positive charge.

D. atoms are made of protons, neutrons, and electrons.

E. protons are 1840 times heavier than electrons.

*Blooms: 2. Understand*

*Chapter - Chapter 2 #8*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*



9.

J. J. Thomson studied cathode ray particles (electrons) and was able to measure the mass/charge ratio. His results showed that

- A. the mass/charge ratio varied as the cathode material was changed.
- B. the charge was always a whole-number multiple of some minimum charge.
- C. matter included particles much smaller than the atom.
- D. atoms contained dense areas of positive charge.
- E. atoms are largely empty space.

*Blooms: 3. Apply*

*Chapter - Chapter 2 #9*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

10.

Who is credited with measuring the mass/charge ratio of the electron?

- A. Dalton
- B. Chadwick
- C. Thomson
- D. Millikan
- E. Rutherford

*Blooms: 1. Remember*

*Chapter - Chapter 2 #10*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

11.

Who is credited with first measuring the charge of the electron?

- A. Dalton
- B. Gay-Lussac
- C. Thomson
- D. Millikan
- E. Rutherford

*Blooms: 1. Remember*

*Chapter - Chapter 2 #11*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

12.

Millikan's oil-drop experiment

- A. established the charge on an electron.
- B. showed that all oil drops carried the same charge.
- C. provided support for the nuclear model of the atom.
- D. suggested that some oil drops carried fractional numbers of electrons.
- E. suggested the presence of a neutral particle in the atom.

*Blooms: 2. Understand*

*Chapter - Chapter 2 #12*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

13.

Who is credited with discovering the atomic nucleus?

- A. Dalton
- B. Gay-Lussac
- C. Thomson
- D. Chadwick
- E. Rutherford

*Blooms: 1. Remember*

*Chapter - Chapter 2 #13*

*Difficulty: Easy*

*Subtopic: Atomic Theories*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

14.

Rutherford bombarded gold foil with alpha (  $\alpha$  ) particles and found that a small percentage of the particles were deflected. Which of the following was not accounted for by the model he proposed for the structure of the atom?

- A. the small size of the nucleus
- B. the charge on the nucleus
- C. the total mass of the atom
- D. the existence of protons
- E. the presence of electrons outside the nucleus

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #14*

*Difficulty: Easy*

*Subtopic: Atomic Theories*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

15.

Which one of the following statements about atoms and subatomic particles is correct?

- A. Rutherford discovered the atomic nucleus by bombarding gold foil with electrons
- B. The proton and the neutron have identical masses.
- C. The neutron's mass is equal to that of a proton plus an electron.
- D. A neutral atom contains equal numbers of protons and electrons.
- E. An atomic nucleus contains equal numbers of protons and neutrons.

*Blooms: 2. Understand*

*Chapter - Chapter 2 #15*

*Difficulty: Medium*

*Subtopic: Atomic Theories*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

16.

Who discovered the neutron, the subatomic particle having a neutral charge?

- A. Millikan
- B. Dalton
- C. Chadwick
- D. Rutherford
- E. Thomson

*Blooms: 1. Remember*

*Chapter - Chapter 2 #16*

*Difficulty: Easy*

*Subtopic: Atomic Theories*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

17.

What is the term for the number of protons in the nucleus of each atom of an element? It also indicates the number of electrons in the atom.

- A. Isotope number
- B. Mass number
- C. Mass-to-charge ratio
- D. Atomic number
- E. Atomic mass units

*Blooms: 1. Remember*

*Chapter - Chapter 2 #17*

*Difficulty: Easy*

*Subtopic: Atomic Theories*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

18.

What is the term for the total number of neutrons and protons in the nucleus of each atom of an element?

- A. Isotope number
- B. Mass number
- C. Mass-to-charge ratio
- D. Atomic number
- E. Atomic mass units

*Blooms: 2. Understand*

*Chapter - Chapter 2 #18*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

19.

Bromine is the only nonmetal that is a liquid at room temperature. Consider the isotope bromine-81,  ${}^{81}_{35}\text{Br}$ . Select the combination which lists the correct atomic number, number of neutrons, and mass number, respectively.

- A. 35, 46, 81
- B. 35, 81, 46
- C. 81, 46, 35
- D. 46, 81, 35
- E. 35, 81, 116

*Blooms: 3. Apply*

*Chapter - Chapter 2 #19*

*Difficulty: Medium*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Elements and the Periodic Table*

*Topic: Components of Matter*

20.

Atoms X, Y, Z, and R have the following nuclear compositions:



I

II

III

IV

Which of the following are isotopes of the same element?

- A. I&II
- B. I&IV
- C. II&IV
- D. III & IV
- E. I&III**

*Blooms: 5. Evaluate*

*Chapter - Chapter 2 #20*

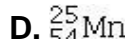
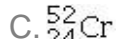
*Difficulty: Medium*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Topic: Components of Matter*

21.

Which isotope is *not* possible?



E. All of these isotopes are possible.

*Blooms: 5. Evaluate*

*Chapter - Chapter 2 #21*

*Difficulty: Hard*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Topic: Components of Matter*

22.

The principal factor that determines whether a nucleus is stable is the

A. electron-to-neutron ratio.

B. electron-to-proton ratio.

C. neutron-to-proton ratio.

D. chemical family.

E. number of electrons.

*Blooms: 2. Understand*

*Chapter - Chapter 2 #22*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*



23.

Which of the following is not a magic number?

- A. 20
- B. 10
- C. 126
- D. 82
- E. 2

*Blooms: 5. Evaluate*

*Chapter - Chapter 2 #23*

*Difficulty: Medium*

*Subtopic: Radioactivity and Nuclear Stability*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

*Topic: Nuclear Chemistry*

24.

Which combination of neutrons and protons leads to the most number of stable nuclei?

- A. Odd number of neutrons and odd number of protons
- B. Even number of neutrons and odd number of protons
- C. Odd number of neutrons and even number of protons
- D. Even number of neutrons and even number of protons
- E. None of the options above results in significantly more stable nuclei.

*Blooms: 3. Apply*

*Chapter - Chapter 2 #24*

*Difficulty: Medium*

*Subtopic: Radioactivity and Nuclear Stability*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

*Topic: Nuclear Chemistry*

25.

As the number of protons increases, stable nuclei will

- A. have an equal number of neutrons and protons.
- B. have an increased ratio of neutrons to protons.
- C. have an odd number of neutrons.
- D. have an decreased ratio of neutrons to protons.
- E. become the most common type of nuclei.

*Blooms: 3. Apply*

*Chapter - Chapter 2 #25*

*Difficulty: Medium*

*Subtopic: Radioactivity and Nuclear Stability*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

*Topic: Nuclear Chemistry*

26.

Atoms of the same element with different mass numbers are called

- A. ions.
- B. neutrons.
- C. chemical groups.
- D. chemical families.
- E. isotopes.

*Blooms: 2. Understand*

*Chapter - Chapter 2 #26*

*Difficulty: Easy*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

27.

How many neutrons are there in an atom of lead whose mass number is 208?

- A. 82
- B. 126**
- C. 208
- D. 290
- E. none of them

*Blooms: 3. Apply*

*Chapter - Chapter 2 #27*

*Difficulty: Medium*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

28.

An atom of the isotope sulfur-31 consists of how many protons, neutrons, and electrons? (p = proton, n = neutron, e = electron)

- A. 15 p, 16 n, 15 e
- B. 16 p, 15 n, 16 e**
- C. 16 p, 31 n, 16 e
- D. 32 p, 31 n, 32 e
- E. 16 p, 16 n, 15 e

*Blooms: 3. Apply*

*Chapter - Chapter 2 #28*

*Difficulty: Medium*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

29.

Give the number of protons (p), electrons (e), and neutrons (n) in one atom of chlorine-37.

- A. 37 p, 37 e, 17 n
- B. 17 p, 17 e, 37 n
- C.** 17 p, 17 e, 20 n
- D. 37 p, 17 e, 20 n
- E. 17 p, 37 e, 17 n

*Blooms: 3. Apply*

*Chapter - Chapter 2 #29*

*Difficulty: Medium*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

30.

Two isotopes of an element differ only in their

- A. symbol.
- B. atomic number.
- C. atomic mass.
- D. number of protons.
- E. number of electrons.

*Blooms: 3. Apply*

*Chapter - Chapter 2 #30*

*Difficulty: Easy*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

31.

The elements in a column of the periodic table are known as

- A. metalloids.
- B. a period.
- C. noble gases.
- D. a group.
- E. nonmetals.

*Blooms: 1. Remember*

*Chapter - Chapter 2 #31*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

32.

Which of these materials are usually poor conductors of heat and electricity?

- A. Metals
- B. Metalloids
- C. Nonmetals
- D. Alkaline earth metals
- E. Alkali metals

*Blooms: 2. Understand*

*Chapter - Chapter 2 #32*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Components of Matter*

33.

Which of these elements is most likely to be a good conductor of electricity?

- A. N
- B. S
- C. He
- D. Cl
- E. Fe

*Blooms: 2. Understand*

*Chapter - Chapter 2 #33*

*Difficulty: Medium*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Components of Matter*

34.

Which of the following elements are the least reactive?

- A. Alkali metals
- B. Noble gases
- C. Halogens
- D. Alkaline earth metals
- E. Metalloids

*Blooms: 3. Apply*

*Chapter - Chapter 2 #34*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

35.

Which of the following is a nonmetal?

- A. Lithium, Li,  $Z = 3$
- B. Bromine, Br,  $Z = 35$
- C. Mercury, Hg,  $Z = 80$
- D. Bismuth, Bi,  $Z = 83$
- E. Sodium, Na,  $Z = 11$

*Blooms: 3. Apply*

*Chapter - Chapter 2 #35*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

36.

Which of the following is a metal?

- A. Nitrogen, N,  $Z = 7$
- B. Phosphorus, P,  $Z = 15$
- C. Arsenic, As,  $Z = 33$
- D. Thallium, Tl,  $Z = 81$
- E. Silicon, Si,  $Z = 14$

*Blooms: 3. Apply*

*Chapter - Chapter 2 #36*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

37.

Which of the following is a metalloid?

- A. Carbon, C,  $Z = 6$
- B. Sulfur, S,  $Z = 16$
- C. Germanium, Ge,  $Z = 32$
- D. Iridium, Ir,  $Z = 77$
- E. Bromine, Br,  $Z = 35$

*Blooms: 3. Apply*

*Chapter - Chapter 2 #37*

*Difficulty: Medium*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

38.

A row of the periodic table is called a(n)

- A. group.
- B. period.
- C. isotopic mixture.
- D. family.
- E. subshell.

*Blooms: 1. Remember*

*Chapter - Chapter 2 #38*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*



39.

Silicon, which makes up about 25% of Earth's crust by mass, is used widely in the modern electronics industry. It has three naturally occurring isotopes,  $^{28}\text{Si}$ ,  $^{29}\text{Si}$ , and  $^{30}\text{Si}$ . Calculate the atomic mass of silicon.

Isotope	Isotopic Mass (amu)	Abundance %
$^{28}\text{Si}$	27.976927	92.22
$^{29}\text{Si}$	28.976495	4.69
$^{30}\text{Si}$	29.973770	3.09

- A. 29.2252 amu
- B. 28.9757 amu
- C. 28.7260 amu
- D. 28.0855 amu**
- E. 27.9801 amu

*Blooms: 3. Apply*

*Chapter - Chapter 2 #39*

*Difficulty: Medium*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Elements and the Periodic Table*

*Topic: Components of Matter*

40.

Lithium forms compounds which are used in dry cells, storage batteries, and in high-temperature lubricants. It has two naturally occurring isotopes,  $^6\text{Li}$  (isotopic mass = 6.015123 amu) and  $^7\text{Li}$  (isotopic mass = 7.016005 amu). Lithium has an atomic mass of 6.9412 amu. What is the percent abundance of lithium-6?

- A. 92.53%
- B. 86.65%
- C. 49.47%
- D. 7.47%**
- E. 6.015%

*Blooms: 3. Apply*

*Chapter - Chapter 2 #40*

*Difficulty: Hard*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Elements and the Periodic Table*

*Topic: Components of Matter*

41.

In the periodic table, atoms are arranged in order of

- A. increasing atomic mass.
- B. increasing atomic number.
- C. physical properties.
- D. periodicity.
- E. chemical reactivities.

*Blooms: 2. Understand*

*Chapter - Chapter 2 #41*

*Difficulty: Easy*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Elements and the Periodic Table*

*Topic: Components of Matter*

42.

The elements in Group 7A are known by what name?

- A. Transition metals
- B. Halogens
- C. Alkali metals
- D. Alkaline earth metals
- E. Noble gases

*Blooms: 1. Remember*

*Chapter - Chapter 2 #42*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

43.

The elements in Group 2A are known by what name?

- A. Transition metals
- B. Halogens
- C. Alkali metals
- D. Alkaline earth metals
- E. Noble gases

*Blooms: 1. Remember*

*Chapter - Chapter 2 #43*

*Difficulty: Medium*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

44.

The alkali metal elements are found in \_\_\_\_\_ of the periodic table.

- A. Group 1A
- B. Group 2A
- C. Group 3A
- D. Period 7
- E. Period 1

*Blooms: 1. Remember*

*Chapter - Chapter 2 #44*

*Difficulty: Medium*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

45.

What term defines a mass which is exactly equal to 1/12 the mass of one carbon-12 atom?

- A. Isotope number
- B. Mass number
- C. Mass-to-charge ratio
- D. Atomic number
- E. Atomic mass unit

*Blooms: 1. Remember*

*Chapter - Chapter 2 #45*

*Difficulty: Easy*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Topic: Components of Matter*

46.

Which of these elements is chemically similar to magnesium?

- A. Sulfur
- B. Calcium
- C. Iron
- D. Nickel
- E. Potassium

*Blooms: 5. Evaluate*

*Chapter - Chapter 2 #46*

*Difficulty: Medium*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Components of Matter*

47.

Which of these elements is chemically similar to oxygen?

- A. Sulfur
- B. Calcium
- C. Iron
- D. Nickel
- E. Potassium

*Blooms: 5. Evaluate*

*Chapter - Chapter 2 #47*

*Difficulty: Medium*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Components of Matter*

48.

Which of these elements is chemically similar to potassium?

- A. calcium
- B. arsenic
- C. phosphorus
- D. cerium
- E. cesium

*Blooms: 5. Evaluate*

*Chapter - Chapter 2 #48*

*Difficulty: Medium*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Components of Matter*

49.

How many atoms are in 0.534 mol of nickel, Ni?

- A. 1.13  $10^{24}$  atoms
- B. 1.48  $10^{25}$  atoms
- C. 2.44  $10^{22}$  atoms
- D.** 3.22  $10^{23}$  atoms
- E. 6.98  $10^{21}$  atoms

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #49*

*Difficulty: Medium*

*Subtopic: The Mole (Definition and Avogadro's Number)*

*Topic: Stoichiometry and Chemical Reactions*

50.

How many atoms are in 7.12 mol of gold, Au?

- A. 1.18  $10^{-23}$  atoms
- B.** 4.29  $10^{24}$  atoms
- C. 8.46  $10^{22}$  atoms
- D. 4.70  $10^{24}$  atoms
- E. 3.34  $10^{26}$  atoms

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #50*

*Difficulty: Medium*

*Subtopic: The Mole (Definition and Avogadro's Number)*

*Topic: Stoichiometry and Chemical Reactions*

51.

How many moles are in  $8.73 \times 10^{25}$  atoms of boron, B?

- A.** 145 moles
- B.  $3.84 \times 10^{27}$  moles
- C. 1.45 moles
- D.  $5.04 \times 10^{-25}$  moles
- E.  $6.90 \times 10^{-3}$  moles

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #51*

*Difficulty: Medium*

*Subtopic: Mole Conversions*

*Subtopic: The Mole (Definition and Avogadro's Number)*

*Topic: Stoichiometry and Chemical Reactions*

52.

How many moles are present in 17.4 g of lead?

- A. 0.0994 moles
- B.  $1.05 \times 10^{25}$  moles
- C.** 0.0840 moles
- D.** 10.06 moles
- E.** 11.9 moles

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #52*

*Difficulty: Medium*

*Subtopic: Molar Mass*

*Subtopic: Mole Conversions*

*Subtopic: The Mole (Definition and Avogadro's Number)*

*Topic: Stoichiometry and Chemical Reactions*

53.

How many grams are present in 0.885 moles of manganese?

- A. 62.1 g
- B. 48.6 g**
- C. 21.5 g
- D. 27.5 g
- E. 0.016 g

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #53*

*Difficulty: Medium*

*Subtopic: Molar Mass*

*Subtopic: Mole Conversions*

*Subtopic: The Mole (Definition and Avogadro's Number)*

*Topic: Stoichiometry and Chemical Reactions*

54.

Determine the mass of hydrogen (in grams) that contains  $5.08 \times 10^{15}$  hydrogen atoms.

- A.  $5.12 \times 10^{15}$  g
- B.  $3.06 \times 10^{39}$  g
- C.  $3.06 \times 10^{-9}$  g
- D.  $8.50 \times 10^{-9}$  g**
- E.  $8.5 \times 10^{15}$  g

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #54*

*Difficulty: Easy*

*Subtopic: Molar Mass*

*Subtopic: Mole Conversions*

*Subtopic: The Mole (Definition and Avogadro's Number)*

*Topic: Stoichiometry and Chemical Reactions*



55.

What element is represented by X in the atomic symbol notation  ${}_{78}^{195}\text{X}$ ?

- A. Iridium
- B. Platinum
- C. Palladium
- D. Selenium
- E. Magnesium

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #55*

*Difficulty: Medium*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Elements and the Periodic Table*

*Topic: Components of Matter*

56.

A rock contains an element with a molar mass of 40.08 g/mol. If  $9.28 \times 10^{24}$  atoms of this element were found in the rock, how many grams of the unknown element are present in the rock?

- A.** 618 g
- B.  $1.49 \times 10^{28}$  g
- C.  $2.24 \times 10^{50}$  g
- D. 0.38 g
- E. 3.80 g

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #56*

*Difficulty: Medium*

*Subtopic: Molar Mass*

*Subtopic: Mole Conversions*

*Subtopic: The Mole (Definition and Avogadro's Number)*

*Topic: Stoichiometry and Chemical Reactions*

57.

Five vials each contain 12 grams of a solid metal sample. The samples include calcium, platinum, barium, gold, and silver. Which vial has the most metal atoms?

- A. Calcium
- B. Barium
- C. Gold
- D. Silver
- E. Platinum

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #57*

*Difficulty: Medium*

*Subtopic: Molar Mass*

*Subtopic: Mole Conversions*

*Subtopic: The Mole (Definition and Avogadro's Number)*

*Topic: Stoichiometry and Chemical Reactions*

58.

Five vials each contain 12 grams of a solid metal sample. The samples include calcium, platinum, barium, gold, and silver. Which vial has the fewest moles of metal atoms?

- A. Calcium
- B. Barium
- C. Gold
- D. Silver
- E. Platinum

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #58*

*Difficulty: Medium*

*Subtopic: Molar Mass*

*Subtopic: Mole Conversions*

*Subtopic: The Mole (Definition and Avogadro's Number)*

*Topic: Stoichiometry and Chemical Reactions*

59.

Determine the number of electrons and identify the correct symbol for an atom with 17 protons and 18 neutrons.

- A.** 17 electrons,  $^{35}_{17}\text{Cl}$
- B.** 18 electrons,  $^{36}_{18}\text{Ar}$
- C.** 17 electrons,  $^{18}_{17}\text{Cl}$
- D.** 17 electrons,  $^{17}_{35}\text{Cl}$
- E.** 18 electrons,  $^{18}_{36}\text{Ar}$

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #59*

*Difficulty: Easy*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

60.

Determine the number of protons, electrons, and neutrons for the isotope gold-118. The symbol for gold is Au.

- A. 118 protons, 118 electrons, 79 neutrons
- B. 79 protons, 79 electrons, 118 neutrons
- C. 79 protons, 79 electrons, 39 neutrons
- D. 118 protons, 118 electrons, 39 neutrons
- E. 79 protons, 39 electrons, 118 neutrons

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #60*

*Difficulty: Medium*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

61.

Determine the number of protons and identify the correct symbol for an atom with 20 neutrons and 20 electrons.

- A. 20 protons,  ${}_{20}^{20}\text{Ca}$
- B. 20 protons,  ${}_{20}^{40}\text{Ca}$
- C. 20 protons,  ${}_{40}^{20}\text{Ca}$
- D. 40 protons,  ${}_{20}^{40}\text{Ca}$
- E. 40 protons,  ${}_{40}^{20}\text{Ca}$

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #61*

*Difficulty: Easy*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

62.

The mass of a neutron is equal to the mass of a proton plus the mass of an electron.

**FALSE**

*Blooms: 2. Understand*

*Chapter - Chapter 2 #62*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

63.

All neutral atoms of tin have 50 protons and 50 electrons.

**TRUE**

*Blooms: 2. Understand*

*Chapter - Chapter 2 #63*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

64.

Copper (Cu) is a transition metal.

**TRUE**

*Blooms: 2. Understand*

*Chapter - Chapter 2 #64*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

65.

Lead (Pb) is a main group element.

**TRUE**

*Blooms: 2. Understand*

*Chapter - Chapter 2 #65*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

66.

Almost all the mass of an atom is concentrated in the nucleus.

**TRUE**

*Blooms: 2. Understand  
Chapter - Chapter 2 #66  
Difficulty: Easy  
Subtopic: Atomic Theories  
Subtopic: Structure of the Atom  
Topic: Components of Matter*

67.

When a beam of alpha particles passes between two electrically charged plates, the beam is deflected toward the positive plate.

**FALSE**

*Blooms: 3. Apply  
Chapter - Chapter 2 #67  
Difficulty: Medium  
Subtopic: Atomic Theories  
Topic: Components of Matter*

68.

J. J. Thomson suggested the term "radioactivity" to describe the spontaneous emission of particles and/or radiation.

**FALSE**

*Blooms: 1. Remember  
Chapter - Chapter 2 #68  
Difficulty: Easy  
Subtopic: Atomic Theories  
Topic: Components of Matter*

69.

The elements in Group 8A are called the\_\_\_\_\_.

**noble gases**

*Blooms: 1. Remember*

*Chapter - Chapter 2 #69*

*Difficulty: Medium*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

70.

The elements in Group 2A are called the\_\_\_\_\_.

**alkaline earth metals**

*Blooms: 1. Remember*

*Chapter - Chapter 2 #70*

*Difficulty: Medium*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

71.

The elements in Group 7A are called the\_\_\_\_\_.

**halogens**

*Blooms: 1. Remember*

*Chapter - Chapter 2 #71*

*Difficulty: Medium*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

72.

The elements in Group 1A are called the\_\_\_\_\_.

**alkali metals**

*Blooms: 1. Remember*

*Chapter - Chapter 2 #72*

*Difficulty: Medium*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

73.

\_\_\_\_\_ is the emission and transmission of energy through space in the form of waves.

**Radiation**

*Blooms: 2. Understand*

*Chapter - Chapter 2 #73*

*Difficulty: Easy*

*Subtopic: Electromagnetic Radiation (Wave Properties)*

*Topic: Quantum Theory and Atomic Structure*

74.

\_\_\_\_\_ is the negatively charged plate connected to a high-voltage source.

**A cathode**

*Blooms: 2. Understand*

*Chapter - Chapter 2 #74*

*Difficulty: Easy*

*Subtopic: Voltaic (Galvanic) Cells*

*Topic: Electrochemistry*



75.

\_\_\_\_\_ are electrons that are deflected away from negatively charged plates.

**particles**

*Blooms: 3. Apply*

*Chapter - Chapter 2 #76*

*Difficulty: Medium*

*Subtopic: Radioactivity and Nuclear Stability*

*Topic: Nuclear Chemistry*

76.

\_\_\_\_\_ are atoms that have the same atomic number ( $Z$ ) but different mass numbers ( $A$ ).

**Isotopes**

*Blooms: 3. Apply*

*Chapter - Chapter 2 #77*

*Difficulty: Easy*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

77.

\_\_\_\_\_ have properties that are intermediate between those of metals and nonmetals.

**Metalloids**

*Blooms: 2. Understand*

*Chapter - Chapter 2 #78*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

78.

The elements in Group 8A are called the\_\_\_\_\_.

**noble gases**

*Blooms: 1. Remember*

*Chapter - Chapter 2 #79*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

79.

\_\_\_\_\_is defined as a mass exactly equal to one-twelfth the mass of one carbon-12 atom.

**One atomic mass unit**

*Blooms: 2. Understand*

*Chapter - Chapter 2 #80*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

80.

A mole is the amount of a substance that contains\_\_\_\_\_of elementary particles (atoms, molecules, etc.).

**Avogadro's number or 6.022    1023 items**

*Blooms: 2. Understand*

*Chapter - Chapter 2 #81*

*Difficulty: Easy*

*Subtopic: The Mole (Definition and Avogadro's Number)*

*Topic: Stoichiometry and Chemical Reactions*

81.

What is the name given for the elements in Group 1A in the periodic table?

Alkali metals

*Blooms: 1. Remember*

*Chapter - Chapter 2 #82*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

82.

What is the name given for the elements in Group 7A in the periodic table?

Halogens

*Blooms: 1. Remember*

*Chapter - Chapter 2 #83*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

83.

Which group is given the name chalcogens?

Group 6A

*Blooms: 1. Remember*

*Chapter - Chapter 2 #84*

*Difficulty: Easy*

*Subtopic: Elements and the Periodic Table*

*Subtopic: Periodic Classification of the Elements*

*Topic: Chemical Periodicity*

*Topic: Components of Matter*

84.

What are the three types of radiation produced by the decay of substances like uranium?

Alpha, beta, and gamma radiation

*Blooms: 2. Understand*

*Chapter - Chapter 2 #85*

*Difficulty: Medium*

*Subtopic: Radioactivity and Nuclear Stability*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

*Topic: Nuclear Chemistry*

85.

The table below describes four atoms.

	Atom A	Atom B	Atom C	Atom D
Number of protons	79	80	80	79
Number of neutrons	118	120	118	120
Number of electrons	79	80	80	79

Which atoms represent the same element?

Atoms A and D represent the same element, and Atoms B and C represent the same element.

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #86*

*Difficulty: Medium*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

86.

In the early 1900s, Ernest Rutherford performed an experiment with thin foils of gold and alpha particles to probe the structure of the atoms. He observed that most of these alpha particles penetrated the foil and were not deflected. Realizing that atoms are electrically neutral (that is, they have equal numbers of protons and electrons) and that the mass of a proton is significantly greater than the mass of an electron, use Rutherford's data to propose a structural model of an atom.

(Answers will vary.) Atoms are mostly empty space. The mass is concentrated mostly at the center of the atom.

*Blooms: 4. Analyze*

*Chapter - Chapter 2 #87*

*Difficulty: Easy*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

87.

State the two important experimental results (and the names of the responsible scientists) which enabled the mass of the electron to be determined.

Thomson measured  $m/e$ , the mass-to-charge ratio. Millikan measured  $e$ , the charge. Thus, the mass  $m$  could be calculated.

*Blooms: 2. Understand*

*Chapter - Chapter 2 #89*

*Difficulty: Medium*

*Subtopic: Structure of the Atom*

*Topic: Components of Matter*

88.

Determine the average atomic mass of boron. The natural abundance of  $^{10}\text{B}$  (weighing 10.0129 amu) is 19.9% and the natural abundance of  $^{11}\text{B}$  (weighing 11.0093 amu) is 80.1%. Show all your work.

$$(10.0129 \text{ amu})(0.199) + (11.0093 \text{ amu})(0.801) = 10.81 \text{ amu}$$

*Blooms: 3. Apply*

*Chapter - Chapter 2 #90*

*Difficulty: Medium*

*Subtopic: Atomic Number, Mass Number, Atomic Symbol, and Isotopes*

*Topic: Components of Matter*

## Chapter 2 - Atoms and the Periodic Table (test bank) Summary

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