Unit 1 Test – Study Guide
Standards for Unit 1

SC1 Obtain, evaluate, and communicate information about the use of the modern atomic theory and periodic law to explain the characteristics of atoms and elements.

SC1a. Evaluate merits and limitations of different models of the atom in relation to relative size, charge, and position of protons, neutrons, and electrons in the atom.

SC1b. Construct an argument to support the claim that the proton (and not the neutron or electron) defines the element’s identity.

SC1c. Construct an explanation based on scientific evidence of the production of elements heavier than hydrogen by nuclear fusion.

SC1d. Construct an explanation that relates the relative abundance of isotopes of a particular element to the atomic mass of the element.

SC1e. Construct an explanation of light emission and the movement of electrons to identify elements.

SC1f. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms (i.e. including atomic radii, ionization energy, and electronegativity).

SC2 Obtain, evaluate, and communicate information about the chemical and physical properties of matter resulting from the ability of atoms to form bonds.

SC2a. Plan and carry out an investigation to gather evidence to compare the physical and chemical properties at the macroscopic scale to infer the strength of intermolecular (phases) and intramolecular forces (bonds).

SC2b. Construct an argument by applying principles of inter- and intramolecular forces to identify substances based on chemical and physical properties.

SC2c. Construct an explanation about the importance of molecular-level structure in the functioning of designed materials.
Question 1. Arrange the following models in the correct timeline of their development and name each model.

SC1a. Evaluate merits and limitations of different models of the atom in relation to relative size, charge, and position of protons, neutrons, and electrons in the atom.
Question 2. Compare the following two models of the atom and reflect how a later model of the atom has been influenced by the earlier model, even though some of the details have been lacking in the earlier model.

SC1a. Evaluate merits and limitations of different models of the atom in relation to relative size, charge, and position of protons, neutrons, and electrons in the atom.
SC1b. Construct an argument to support the claim that the proton (and not the neutron or electron) defines the element’s identity.
Question 5: What are the three characteristics of the energy of electrons? Explain each.

Or

Do all electrons in an atom have the same amount of energy?
Question 6. Identify the element each of the following diagrams of nucleus represent? <!> represents neutron.
(a) hydrogen, helium, beryllium, lithium, oxygen, silicon, carbon, nitrogen
(b) hydrogen, deuterium, tritium, helium, oxygen, nitrogen, nitrogen, carbon, beryllium
(c) hydrogen, deuterium, helium, tritium, nitrogen, nitrogen, carbon, beryllium
(d) hydrogen deuterium, helium, tritium, nitrogen, oxygen, carbon, beryllium

SC1b. Construct an argument to support the claim that the proton (and not the neutron or electron) defines the element’s identity.
Question 7. Identify the element each of the following diagrams of nucleus represent?
(a) Bromine, Argon, Scandium
(B) Copper, Chlorine, Calcium
(c) Zinc, Argon, Potassium
SC1d. Construct an explanation that relates the relative abundance of isotopes of a particular element to the atomic mass of the element.
SC1b. Construct an argument to support the claim that the proton (and not the neutron or electron) defines the element’s identity.

(Multiple Choice)

Question 9. Identify the nuclear charge respectively in each of the following elements: Sodium, Silver, Mercury, and Gold
(a) 14, 16, 34, 42
(b) 11, 47, 80, 79
(c) 16, 34, 42, 80
Question 10. Heavier elements are formed from lighter elements by the process of nuclear fusion. Identify (A), (B), (C), and (D) in the following diagram of nuclear fusion, which takes place in the Sun.
(a) Helium, Lithium, Beryllium, Hydrogen
(b) Helium, Tritium, Beryllium, Proton
(c) Deuterium, Tritium, Helium, Neutron

SC1c. Construct an explanation based on scientific evidence of the production of elements heavier than hydrogen by nuclear fusion.
Question 11. Heavier elements are formed from lighter elements by the process of nuclear fusion. Identify (A) and (B) in the following diagram of nuclear fusion reactions.
(a) A is Oxygen-16, B is Oxygen-16,
(b) A is Oxygen-16, B is Helium-4
(c) A is Beryllium-8, B is Magnesium

SC1c. Construct an explanation based on scientific evidence of the production of elements heavier than hydrogen by nuclear fusion.
SC1b. Construct an argument to support the claim that the proton (and not the neutron or electron) defines the element’s identity.

Question 12. Identify the element represented by the following diagrams of atoms 1, 2, and 3 represent?
(a) Nitrogen, Arsenic, Selenium
(b) Silicon, Tungsten, Platinum
(c) Magnesium, Darmstadtium, Tennesine
Question 13. Which of the following is the correct formula for calculating the average atomic mass of an element?

(a) $\sum$ percent abundance x 100 ÷ Isotope mass

(b) $\sum$ percent abundance ÷ Isotope mass x 100

(c) $\sum$ percent abundance x Isotope mass ÷ 100

SC1d. Construct an explanation that relates the relative abundance of isotopes of a particular element to the atomic mass of the element.
Question 14. Chromium is a metal, which is an important ingredient in the preparation of stainless steel, an alloy widely used in our daily lives from household gadgets to huge machineries. Chromium provides corrosion resistance to stainless steel and prevents rusting. Chromium exists in four main isotopes, which have atomic masses as given below:
Cr-50 with atomic Mass of 49.9460442 amu
Cr-52 with atomic Mass of 51.9405075 amu
Cr-53 with atomic Mass of 52.9406494 amu
Cr-54 with atomic Mass of 53.9388804 amu

If the average atomic mass of chromium is 51.996 amu, which isotope you think is the most abundant isotope?

(a) Cr-50
(b) Cr-52
(c) Cr-53
(d) Cr-54

SC1d. Construct an explanation that relates the relative abundance of isotopes of a particular element to the atomic mass of the element.
Question 15. What is the difference between Carbon-12 and Carbon-14?

(a) Carbon-14 has 2 less protons than Carbon-12
(b) Carbon-14 has 2 less neutrons than Carbon-12
(c) Carbon-14 has 2 more protons than Carbon-12
(d) Carbon-14 has 2 more neutrons than Carbon-12

SC1d. Construct an explanation that relates the relative abundance of isotopes of a particular element to the atomic mass of the element.
Question 16. Titanium is a light but tough metal. It is used in the construction of spacecrafts and missiles. Titanium occurs as several isotopes. How is Titanium-43 different from Titanium-50?

(a) Titanium-43 has 21 neutrons whereas Titanium-50 has 28 neutrons
(b) Titanium-43 has 43 electrons whereas Titanium-50 has 50 electrons
(c) Titanium-43 has 43 protons whereas Titanium-50 has 50 protons
(d) Titanium-43 has 21 neutrons whereas Titanium-50 has 23 neutrons
Question 17. Excitation and Relaxation are opposite phenomena connected with movement of electrons on between shells of an atom. Choose the correct statement about these two phenomena.

(a) During excitation electron moves from outer shell to inner shell in multiple steps  
(b) During excitation electron moves from outer shell to the inner shell in single step  
(c) During relaxation electron moves from outer shell to the inner shell in multiple steps  
(d) During relaxation electron moves from outer shell to the inner shell in single or multiple steps

SC1e. Construct an explanation of light emission and the movement of electrons to identify elements.
Question 18. Which of the following diagrams represents the excitation process correctly?
(a) Left
(b) Middle
(c) Right
Question 19. Which of the following diagrams represents the emission of colors by the metal ions during the flame test?
(a) Left
(b) Middle
(c) Right
Question 20. During the flame test, we observe colors characteristic of elements because

(a) electrons gain energy as they return to lower energy levels from an higher energy level
(b) electrons emit energy as they return to lower energy levels from a higher energy level
(c) electrons gain energy as they move from a lower energy level to a higher energy level
(d) electrons emit energy as they move from a lower energy level to a higher energy level

(Multiple Choice)

SC1e. Construct an explanation of light emission and the movement of electrons to identify elements.
Question 21. During the flame test, we observe colors characteristic of elements because

(a) electrons return to lower energy levels from higher energy levels by absorbing color
(b) electrons move to higher energy levels from lower energy levels by emitting color
(c) electrons move to higher energy levels from lower energy levels by emitting color
(d) electrons return to lower energy levels from higher energy levels by emitting color

SC1e. Construct an explanation of light emission and the movement of electrons to identify elements.
Question 22. During the flame test, we observe colors characteristic of elements because of

(a) excitation process, which is slower than the relaxation process
(b) both relaxation and excitation processes, which take place at the same speed
(c) relaxation process which is slower than the excitation process
(d) Mostly due to excitation and partly due to relaxation process

SC1e. Construct an explanation of light emission and the movement of electrons to identify elements.
Question 23. During the flame test, we observe colors characteristic of elements. Which of the following options provide the correct color for each of the elements?

(a) Barium: Apple green, Lithium: Scarlet Red; Strontium: Brick Red; Copper: Lavender; Sodium: Blue
(b) Barium: Apple green, Lithium: Scarlet Red; Strontium: Crimson Red; Copper: Greenish blue; Sodium: Yellow
(c) Barium: Bluish green, Lithium: Crimson Red; Strontium: Scarlet Red; Copper: Lavender; Sodium: Blue
Question 24. During cooking, sometimes, when you are stirring the food and there is a spill over the flame, the flame turns yellow, this is due to

(a) Sodium ions in the common salt and or baking soda
(b) Magnesium ions in the food
(c) Potassium ions in the food

SC1e. Construct an explanation of light emission and the movement of electrons to identify elements.
SC2c. Construct an explanation about the importance of molecular-level structure in the functioning of designed materials.

(Multiple Choice)

Question 25. In the electronic excitation-relaxation phenomena, electrons can transit

(a) up to the third shell only
(b) up to the seventh shell only
(c) up to the sixth shell only
(d) up to the first shell only
Question 26. The elements in the first group of the periodic table are known as -------------- Metals. They have the ------------------ ionization energy and form cations readily as they have ------ electron -------- than the noble gases.

(a) Alkali, highest, one, more
(b) Transition, highest, three to nine, more
(c) Alkaline earth, second highest, two, more
(d) Alkali, highest, one, less
Question 27. The elements in the last group of the periodic table are known as ______________. They have the ______________ reactivity and ______________ compounds as they have a fully filled ______________.

(a) Alkaline Earth, lowest, form, nucleus
(b) Transition, highest, do not form, s orbital
(c) Noble Gases, lowest, do not form, valence shell
(d) Noble Gases, highest, form, valence shell

SC1f. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms (i.e. including atomic radii, ionization energy, and electronegativity).
Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms (i.e. including atomic radii, ionization energy, and electronegativity).

Question 28. The elements in the 7th group of the periodic table are known as _______________. They have the _______________ electronegativity and _______________ anions as they have one ___________ electron as compared with _______________.

(a) Metalloids, lowest, form, more, Metals
(b) Lanthanides, highest, do not form, more, Noble Gases
(c) Actinides, lowest, do not, less, Transition Metals
(d) Halogens, highest, form, less, Noble Gases
Question 29. The Transition elements have the ________ orbital successively filled with electrons; the lanthanides and actinides have ________ orbital successively filled with electrons.

(a) f, d  
(b) s, p  
(c) p, f  
(d) d, s  
(e) d, f  
(f) f, s  

(Multiple Choice)

SC1f. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms (i.e. including atomic radii, ionization energy, and electronegativity).
Question 30. In the electronic excitation-relaxation lab investigation, you observed different rates for color change for real-world functional materials. This is because they have different

(a) Density
(b) Colors
(c) Nuclear structure
(d) Molecular structure

SC2c. Construct an explanation about the importance of molecular-level structure in the functioning of designed materials.
Question 31. In the Anabolism-Catabolism task, you learned that the secondary structure of DNA is stabilized by which of the following intermolecular forces: 
(a) van der Waal’s forces
(b) Hydrogen Bonding
(c) Nitrogen bonding

SC2b. Construct an argument by applying principles of inter- and intramolecular forces to identify substances based on chemical and physical properties.
SC2b. Construct an argument by applying principles of inter- and intramolecular forces to identify substances based on chemical and physical properties.

Question 32. In your lab investigations, you found that even though ethyl alcohol, rubbing alcohol, and water have similar structure, they have different boiling points and vaporize at different time intervals when placed on the surface of a turned-on overhead projector. What causes the difference in their rate of evaporation?

(a) Extent and Strength of intermolecular hydrogen bonding
(b) Extent and Strength of intramolecular covalent bonding
Question 33. The boiling point of ethyl alcohol is -------------- that of acetone
(a) higher than
(b) lower than
(c) the same as

SC2b. Construct an argument by applying principles of inter- and intramolecular forces to identify substances based on chemical and physical properties.
SC2b. Construct an argument by applying principles of inter- and intramolecular forces to identify substances based on chemical and physical properties.

Question 34. It is a common observation during cooking that cheese melts at a higher temperature than butter. What causes the difference in their melting point?

(a) Strong intermolecular forces in butter require less heat energy to melt
(b) Strong intermolecular forces in cheese require more energy to melt
(c) Weak intermolecular forces in cheese require more energy to melt

(Multiple Choice)
Question 35. Pasta dough is a wonderful engineering material; you can mold pasta dough into different shapes and different designs with intricate details; the mechanical integrity of pasta can be ascribed to (a) Hydrogen bonding (b) Peptide bonding (c) van der Waal’s forces (d) Hydrogen and Peptide bonding

SC2b. Construct an argument by applying principles of inter- and intramolecular forces to identify substances based on chemical and physical properties.
Question 36. In your lab investigations, you found that some homogeneous mixtures can be separated by using a centrifuge. Blood is a homogeneous mixture. When you spin blood in a centrifuge, red blood cells, buffy coat, and plasma separate because they have different

(a) colors
(b) odors
(c) density (or specific gravity) values
(d) melting points
(e) boiling points

SC2b. Construct an argument by applying principles of inter- and intramolecular forces to identify substances based on chemical and physical properties.
Question 37. The boiling points of three liquid substances are given below. Liquid A: 48 °C; Liquid B: 48 °C; Liquid C: 108 °C; They are miscible with each other. You have been provided with a homogeneous mixture containing all the three. How would you separate them individually from the mixture?

(a) by filtration  
(b) by centrifugation  
(c) by distillation  
(d) by paper chromatography
SC2b. Construct an argument by applying principles of inter- and intramolecular forces to identify substances based on chemical and physical properties.

Question 38. Paper chromatography involves capillary action. The thin pores in the paper act as capillaries aiding the rise of liquids. Examine the capillary rise in the following four scenarios. Which property of a liquid determines its capillary action?
(a) Surface Tension
(b) Boiling point
(c) Melting Point
(d) Conductivity
(d) Viscosity
(e) Vapor Pressure

(Multiple Choice)
Question 39. Bites from venomous snakes are often fatal in nature. Snake’s venom breaks apart the homogeneity of blood’s components by:

(a) Complexation  
(b) Coagulation  
(c) Coordination  
(d) Compound formation
Question 40. You have a mixture of sand and saltwater; which combination of separation techniques would you use to separate sand, salt, and water.

(a) Evaporation & Handpicking
(b) Filtration & Decantation
(c) Filtration & Evaporation
(d) Filtration & Distillation
ANSWERS
Answers for Multiple Choice Questions

6 (b)  7 (c)  8 (a)  9 (c)  10 (c)  11 (a)  12 (b)  13 (c)  14 (b)  15 (d)  16 (a)  17 (d)  18 (b)  19 (a)  20 (b)  21 (d)  22 (c)  23 (b)  24 (a)  25 (c)  26 (a)  27 (c)  28 (d)  29 (e)  30 (d)  31 (b)  32 (a)  33 (b)  34 (d)  35 (b)  36 (c)  37 (c)  38 (a)  39 (b)  40 (c)
Question 5. A metal, very widely used in making semiconductors for electronics has three main isotopes. The three isotopes have atomic masses and relative abundances of 27.9769 amu (92.2297%), 28.9765 amu (4.6832%) and 29.9738 amu (3.0872%). Identify the metal. (Use calculator for your calculations and Periodic Table for your reference)

\[
\text{Average Atomic Mass} = \frac{\sum \text{percent abundance} \times \text{Isotope mass}}{100} \text{ amu}
\]

\[
[27.9769 \times 92.2297/100] + [28.9765 \times 4.6832/100] + [29.9738 \times 3.0872/100] \text{ amu}
\]

\[
25.8030109393 + 1.357027448 + 0.9253511536 \text{ amu}
\]

\[
= 28.0853895409 \text{ amu}
\]

\[
= 28.085 \text{ amu (rounded to the third decimal)}
\]

The element with an atomic mass of 28.085 amu is Silicon.
Therefore, the metal is Silicon.

SC1d. Construct an explanation that relates the relative abundance of isotopes of a particular element to the atomic mass of the element.
Question 1. Arrange the following models in the correct timeline of their development and name each model.

- John Dalton
- J.J. Thomson
- Nagayoka
- Rutherford
- Bohr
- Schrodinger

SC1a. Evaluate merits and limitations of different models of the atom in relation to relative size, charge, and position of protons, neutrons, and electrons in the atom.
**Answer**

**Question 2.** Compare the following two models of the atom and reflect how a later model of the atom has been influenced by the earlier model, even though some of the details have been lacking in the earlier model.

In 1904, Nagayoka proposed the Saturnian Model of the atom in which electrons were not depicted as particles but as a diffuse dusty ring revolving around a positively charged distinct sphere. In 1926, Schrödinger, based on his mathematical calculations, put forth the Electron Cloud Model of the Atom, in which he showed electrons to be present in the atom as an electron cloud, which is diffuse and revolving around the central positively charged nucleus. He proved that considering the very very minute size of the electron, its negligible mass, and its incredible speed, electrons cannot be seen as particles but as a set of diffuse streams of waves. It is quite obvious that Shrödinger drew a lot of inspiration from Nagayoka’s model and further improvised it. In his improvisation, Schrödinger has adopted Rutherford’s idea of small dense nucleus at the center of the atom, which is made up of many positively charged particles called neutrons. So he shrank the size of the nucleus in his model. Schrödinger, did not stop at this level. With the discovery of neutrons by Chadwick in 1932, he was able to provide finer details of the nucleus as composed of neutrons and protons. Thus, Schrödinger had the advantage of several discoveries having happened after Nagayoka’s model. He was able to incorporate them and provided a better model of the atom, which is more detailed and is currently known as the Quantum Mechanical Model of the atom. It can therefore be said that Nagayoka’s model provided the basis for the Schrödinger model.

SC1a. Evaluate merits and limitations of different models of the atom in relation to relative size, charge, and position of protons, neutrons, and electrons in the atom.
Question 3. Prove that proton and not electron nor neutron is the identity of an element.

Any component of system that can serve as an identity should be the one that does not change at any time.

Why electrons cannot be the identity of the atom
Atoms can lose or gain electron in a chemical change. When they lose, the number of electrons decreases and atoms form cations, the positively charged species, which are smaller in size compared to the atom. When atoms gain electrons, they form Anions, the negatively charged species, which are bigger than the atom. Thus, electrons not only change in their count, their change in count also alters the characteristics of the atom. Therefore, they cannot serve as the identity for the atom.

Why neutrons cannot be the identity of the atom
Atoms of the same element can have different number of neutrons. Such atoms of the same element are called isotopes. Isotopes have different mass numbers. Mass number determines the physical properties such as boiling/melting/density etc. Thus a change in the number of protons alters the physical properties of the element. Therefore, neutrons cannot serve as the identity of the element.

Why protons alone can serve as the identity
For a given element, the number of protons is a constant. It is defined as the Atomic Number (Z) of the element, which is fixed for an element. The number of protons does not change whether the atom becomes the ion (cation or anion) or the isotope. The periodic table organizes elements in the increasing order of atomic number, starting from Hydrogen with an atomic number of 1, ending in 118, which is the atomic number of the last element, namely Oganesson. Being an invariable, and being a specific count for a given element, the number of protons alone can serve as the identity of the element.
**Habits of Mind**

**SCSh1.** Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science. a. Exhibit the above traits in their own scientific activities. b. Recognize that different explanations often can be given for the same evidence. c. Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.

1. The following experiments
2. J.J. Thomson’s discovery that cathode rays are made up of electrons
3. Milliken’s oil drop experiment
4. Rutherford’s gold foil experiment

**The Nature of Science**

**SCSh7.** Students will analyze how scientific knowledge is developed. Students recognize that: a. The universe is a vast single system in which the basic principles are the same everywhere. b. Universal principles are discovered through observation and experimental verification. c. From time to time, major shifts occur in the scientific view of how the world works. More often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge. Major shifts in scientific views typically occur after the observation of a new phenomenon or an insightful interpretation of existing data by an individual or research group. d. Hypotheses often cause scientists to develop new experiments that produce additional data. e. Testing, revising, and occasionally rejecting new and old theories never ends.

**SCSh8.** Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices: a. Scientific investigators control the conditions of their experiments in order to produce valuable data. b. Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations’ hypotheses, observations, data analyses, and interpretations. c. Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting. d. The merit of a new theory is judged by how well scientific data are explained by the new theory. e. The ultimate goal of science is to develop an understanding of the natural universe which is free of biases. f. Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.
Question 5: What are the three characteristics of the energy of electrons?

Two electrons in an atom can have the same amount of energy
Shells in an atom are called energy levels. Electrons in a shell have the same energy of the shell. So any two electrons in the same shell will have the same energy.

Two electrons in an atom can have different amounts of energy
Shells in an atom are called energy levels. The energy of the shell increases as we move from inner to outer. Since energy of the electron is equal to the energy of the shell, electrons residing in different shells will have different energy.

The same electron in an atom can have different amounts of energy
Electrons have two states: Ground State and Excited State. Excited State is the Home Shell of the electron. Excited State is the new outer shell to which an electron moves temporarily when it has absorbed energy.

So the same electron can have different amounts of energy because of the excitation process.
Quick Review
(1) Nuclear Charge: Number of protons in the nucleus of the atom, which is nothing but the atomic number

<table>
<thead>
<tr>
<th>Element</th>
<th>Nuclear Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protium</td>
<td>1</td>
</tr>
<tr>
<td>Deuterium</td>
<td>1</td>
</tr>
<tr>
<td>Tritium</td>
<td>1</td>
</tr>
<tr>
<td>Helium</td>
<td>2</td>
</tr>
<tr>
<td>Sodium</td>
<td>11</td>
</tr>
<tr>
<td>Chlorine</td>
<td>17</td>
</tr>
</tbody>
</table>

Find the nuclear charge for
- Calcium
- Rubidium
- Copper
- Bromine
- Oganesson

(2) Which of the following is the correct combination of protons and neutrons for the Lithium atom?

(a) 
(b) 
(c) 
(d) 

(3) Remember: In the flame test, you see the color because of the relaxation process of electrons returning to inner energy levels from the outer energy levels.

(4) Generally, count the number of protons; the number of protons gives the atomic number; use the atomic number to identify the element from the periodic table. If proton is not given, but electrons are given, count the number of electrons to identify the element. In an atom the number of electrons is equal to the number of protons, which is in turn equal to the atomic number.

**Excitation**
Inner to outer energy levels by absorption of energy

**Relaxation**
Outer to inner energy levels by emission of color or energy
What is the difference between Protium, Deuterium, and Tritium?

Which of the following is the correct formula for calculating the average atomic mass of an element?

(a) \( \sum \frac{\text{percent abundance} \times 100}{\text{isotope mass}} \)
(b) \( \sum \frac{\text{percent abundance}}{\text{isotope mass}} \times 100 \)
(c) \( \sum \frac{\text{percent abundance} \times \text{isotope mass}}{100} \)

The bottom number is atomic number. Refer to the periodic table and take it.

The sum of the top number of the ones on the left is equal to the top number of the one on the right.

The sum of the bottom numbers on the left is equal to the bottom number on the right.

To find out the top and bottom number for that on the left, subtract and find the difference.

What is the difference between Carbon-12 and Carbon-14?

Oxygen-16 and Oxygen-18

Chlorine-35 and Chlorine-39

Match

Covalent Centrifugation Distillation Cheese Capillary rise

Peptide and hydrogen bonding Surface Tension Strong odor Boiling point Density

A is Magnesium; B is Oxygen

The three major isotopes of magnesium and their masses are given in the chart. If the average atomic mass of magnesium is 24.3050 amu, which isotope is the most abundant isotope?

Answer: Mg-24

Remember Ionization energy decreases as you move down the group in the Periodic Table.