

Deep Run High School

**CHEMISTRY I: 3(A), 5(A), 7(A)**

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## Unit 4 Quiz

**Due Date: November 20, 2019**

**Instructors: Jennifer Krug, Mr. Wilson, Mrs. Tique**

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**ID: 1183**

Name: \_\_\_\_\_

Score:

/ 100

Instructions:

**This quiz contains 25 total questions - 23 random questions from Unit 4 Periodic Trends, 1 question about significant figures, and 1 question about accuracy and precision. You will have 40 minutes to complete this assessment.**

Question 1

/1

**All of the following are true of ionic radii *EXCEPT* -**

- ☐ Metals get smaller when they become cations.
- ☐ Nonmetals get larger when they become anions.
- ☐ Noble gases form the largest ions.
- ☐ The shielding effect increases for ionic radii as you move down a group.

Name: \_\_\_\_\_

Question 2

 /1**Which cation will have the largest radius?**☐ Al <sup>+3</sup>☐ Mg <sup>+2</sup>☐ Na <sup>+1</sup>☐ Si <sup>+4</sup>

Question 3

 /1**When a lithium atom becomes an ion, it has \_\_\_\_\_ electrons than protons.**☐ 3 less☐ 1 less☐ 2 more☐ 7 more

Name: \_\_\_\_\_

Question 4

/1

**Which chemist organized the first periodic table based on average atomic mass?**

- ☐ Dmitri Mendeleev
- ☐ Neils Bohr
- ☐ Ernest Rutherford
- ☐ Henry Moseley

Question 5

/1

**Compared to the amount of shielding in a Fluorine (F) atom, a Nitrogen (N) atom would have –**

- ☐ less shielding
- ☐ more shielding
- ☐ the same amount of shielding

Name: \_\_\_\_\_

Question 6

 /1

**Compared to the amount of shielding of an oxygen atom, a phosphorus atom would have –**

- ☐ less shielding
- ☐ more shielding
- ☐ the same amount of shielding

Question 7

 /1

**As you move down a group, shielding**

- ☐ remains constant because the number of protons equals the number of electrons.
- ☐ decreases because the atomic radius increases.
- ☐ increases because atoms contain more core orbitals.
- ☐ decreases because the electronegativity decreases.

Name: \_\_\_\_\_

Question 8

 /1

**Which chemist organized the modern periodic table, which is based on the atomic number of elements?**

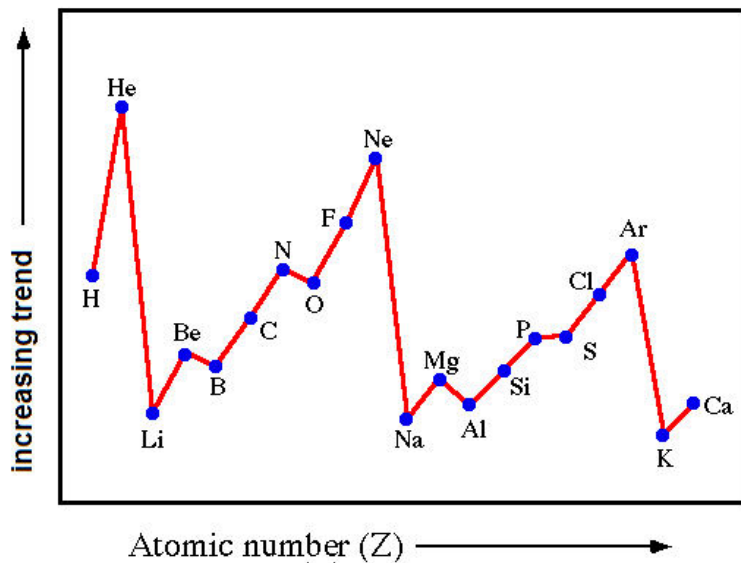
- ☐ Dmitri Mendeleev
- ☐ Neils Bohr
- ☐ Ernest Rutherford
- ☐ Henry Moseley

Name: \_\_\_\_\_

Question 9

/1

The diagram below represents the periodic trend for \_\_\_\_\_.



- ☐ Metallic Properties
- ☐ Electronegativity
- ☐ Ionization Energy
- ☐ Atomic Radii

Name: \_\_\_\_\_

Question 10

 /1

Which periodic trend is a measure of the energy required to remove a valence electron?

- ☐ Ionization Energy
- ☐ Shielding
- ☐ Electronegativity
- ☐ Ionic Radii

Question 11

 /1

Which element in Group 2 has the greatest tendency to lose an electron?

- ☐ Ca
- ☐ Mg
- ☐ Be
- ☐ Sr



Name: \_\_\_\_\_

Question 12

 /1

Which of the following elements has a full octet?

☐ Fe☐ Al☐ Ca☐ Ne

Question 13

 /1

How many valence electrons does a sulfur atom contain?

☐ 4☐ 32☐ 16☐ 6

Name: \_\_\_\_\_

Question 14

 /1**Which combination of atoms will form an ionic bond?**

- ☐ Na and K
- ☐ Mg and Cl
- ☐ Cu and Zn
- ☐ C and O

Question 15

 /1**Which of the following statements is true about metal ions?**

- ☐ Metals lose electrons in their valence orbital in order to achieve a stable noble gas electron configuration.
- ☐ Metals gain electrons in their valence orbital in order to achieve a stable noble gas electron configuration.
- ☐ Metals gain electrons to complete their valence orbital and satisfy the octet rule.
- ☐ Metals lose electrons in their inner core orbitals in order to satisfy the octet rule.

Name: \_\_\_\_\_

Question 16

 /1

Which of the following is an example of a chemical property of metals?

- ☐ Malleability
- ☐ Conductivity
- ☐ Appearance
- ☐ Reactivity

Question 17

 /1

Which of the following elements is the most reactive?

- ☐ Mg
- ☐ Ca
- ☐ Rb
- ☐ K

Name: \_\_\_\_\_

Question 18

 /1

How many significant figures are in the number  $6.02 \times 10^{23}$ ?

- ☐ 5
- ☐ 2
- ☐ 3
- ☐ infinite

Question 19

 /1

Which of these elements has the least attraction for electrons in a chemical bond?

- ☐ Sulfur (S)
- ☐ Aluminum (Al)
- ☐ Magnesium (Mg)
- ☐ Argon (Ar)

Name: \_\_\_\_\_

Question 20

 /1

**Which of the following elements has the highest electronegativity?**

- ☐ Arsenic (As)
- ☐ Phosphorus (P)
- ☐ Nitrogen (N)
- ☐ Antimony (Sb)

Question 21

 /1

**Which group of the periodic table has the highest electronegativity?**

- ☐ Halogens
- ☐ Transition Metals
- ☐ Alkaline Earth Metals
- ☐ Nobel Gases

Name: \_\_\_\_\_

Question 22

 /1**Which of these elements has the smallest atomic radius?**

- ☐ Sodium (Na)
- ☐ Oxygen (O)
- ☐ Beryllium (Be)
- ☐ Sulfur (S)

Question 23

 /1**As you go down a group of the periodic table, the atomic radii increases due to**

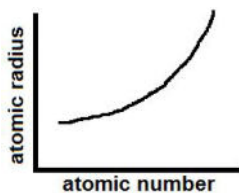
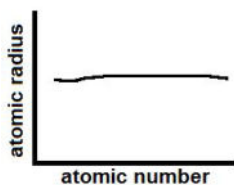
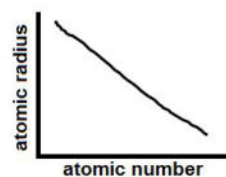
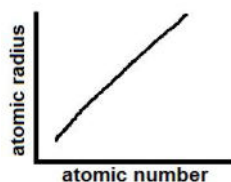
- ☐ increased shielding effect
- ☐ decreased electron repulsion
- ☐ decreased number of protons
- ☐ increased nuclear force

Name: \_\_\_\_\_

Question 24

/1

Which graph represents the correct trend in atomic radius as you move down a column?

☐☐☐☐

Name: \_\_\_\_\_

Question 25

/1

Your lab group carries out a lab in which you measure the boiling point of an unknown liquid. Your group collects the following data.

Trial #1            99.4 °C

Trial #2            99.2 °C

Trial #3            99.8 °C

If the accepted boiling point of the unknown liquid is **87.4 °C**, describe the precision and accuracy of the data points.

- ☐ Both accurate and precise
- ☐ Accurate but not precise
- ☐ Precise but not accurate
- ☐ Neither accurate nor precise



Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

**Instructions for grading:** Grade each question and tally the score to obtain the total test points. If the factor does not equal 1, multiply the total points by the factor to obtain the student's final score.

## Question 1

All of the following are true of ionic radii *EXCEPT* -



Nobel gases form the largest ions.

1 possible pts.

## Question 2

Which cation will have the largest radius?



Na<sup>+1</sup>

1 possible pts.

Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

## Question 3

When a lithium atom becomes an ion, it has \_\_\_\_\_ electrons than protons.



1 less

1 possible pts.

## Question 4

Which chemist organized the first periodic table based on average atomic mass?



Dmitri Mendeleev

1 possible pts.

## Question 5

Compared to the amount of shielding in a Fluorine (F) atom, a Nitrogen (N) atom would have –



the same amount of shielding

1 possible pts.

Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

## Question 6

Compared to the amount of shielding of an oxygen atom, a phosphorus atom would have –



more shielding

1 possible pts.

## Question 7

As you move down a group, shielding



increases because atoms contain more core orbitals.

1 possible pts.

## Question 8

Which chemist organized the modern periodic table, which is based on the atomic number of elements?



Henry Moseley

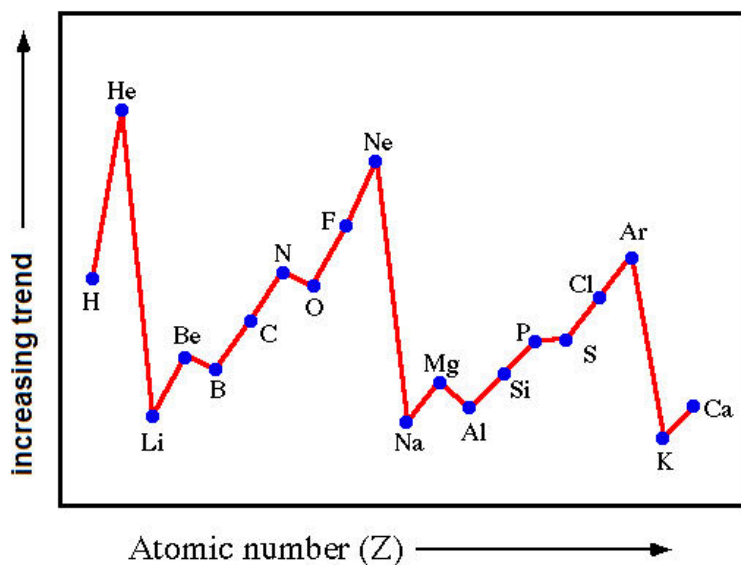
1 possible pts.

## Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

## Question 9

The diagram below represents the periodic trend for \_\_\_\_\_.



Ionization Energy

1 possible pts.

Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

Question 10

Which periodic trend is a measure of the energy required to remove a valence electron?



Ionization Energy

1 possible pts.

Question 11

Which element in Group 2 has the greatest tendency to lose an electron?



Sr

1 possible pts.

Question 12

Which of the following elements has a full octet?



Ne

1 possible pts.

Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

## Question 13

How many valence electrons does a sulfur atom contain?



6

1 possible pts.

## Question 14

Which combination of atoms will form an ionic bond?



Mg and Cl

1 possible pts.

## Question 15

Which of the following statements is true about metal ions?



Metals lose electrons in their valence orbital in order to achieve a stable noble gas electron configuration.

1 possible pts.

Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

Question 16

Which of the following is an example of a chemical property of metals?



Reactivity

1 possible pts.

Question 17

Which of the following elements is the most reactive?



Rb

1 possible pts.

Question 18

How many signifcant figures are in the number  $6.02 \times 10^{23}$ ?



3

1 possible pts.

Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

## Question 19

**Which of these elements has the least attraction for electrons in a chemical bond?**



Argon (Ar)

1 possible pts.

## Question 20

**Which of the following elements has the highest electronegativity?**



Nitrogen (N)

1 possible pts.

## Question 21

**Which group of the periodic table has the highest electronegativity?**



Halogens

1 possible pts.



Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

## Question 22

Which of these elements has the smallest atomic radius?



Oxygen (O)

1 possible pts.

## Question 23

As you go down a group of the periodic table, the atomic radii increases due to



increased shielding effect

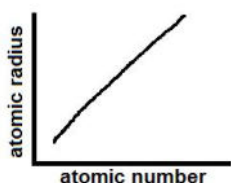
1 possible pts.

Answer Key

Possible Points: 25 Factor: x4.00 Test Value: 100

## Question 24

Which graph represents the correct trend in atomic radius as you move down a column?



1 possible pts.

## Question 25

Your lab group carries out a lab in which you measure the boiling point of an unknown liquid. Your group collects the following data.

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Precise but not accurate

1 possible pts.