Deep Run High School

CHEMISTRY I HON: 2(A)

Unit 4 Test

Due Date: **November 25, 2019**

Instructor: **Jennifer Krug**

ID: **9347**

Name: _____ Score: / 100

Question 1

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

- [ ] Ernest Rutherford
- [ ] Dmitri Mendeleev
- [ ] Neils Bohr
- [ ] Henry Moseley

Question 2

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

- [ ] Ernest Rutherford
- [ ] Dmitri Mendeleev
- [ ] Neils Bohr
- [ ] Henry Moseley

Name: _____

Question 3

Classify the following information: "The atomic number increases across a period."

- ☐ Qua**L**itative
- ☐ Qua**N**titative

Question 4

Classify the following information: "A p-orbital can hold up to six electrons."

- ☐ Qua**L**itative
- ☐ Qua**N**titative

Question 5

Classify the following information: "An alloy is a mixture of two or more metals."

- ☐ Qua**L**itative
- ☐ Qua**N**titative

Name: _____

Question 6

Classify the following information: "The pH indicator turned the solution blue."

- ☐ Qua**L**itative
- ☐ Qua**N**titative

Question 7

Classify the following information: "Temperature is related to the average kinetic energy."

- ☐ Qua**L**itative
- ☐ Qua**N**titative

Question 8

Which cation will have the largest radius?

- ☐ Na^{+1}
- ☐ Al^{+3}
- ☐ Mg^{+2}
- ☐ Si^{+4}

Name: _____

Question 9

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

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

Question 10

When an oxygen atom becomes an ion, it has _____ electrons than protons.

- [ ] 2 more
- [ ] 8 more
- [ ] 2 less
- [ ] 8 less

Name: _____

Question 11

Which cation will have the largest radius?

- ☐ K^{+1}
- ☐ Rb^{+1}
- ☐ Ca^{+2}
- ☐ Sr^{+2}

Question 12

Which anion will have the largest radius?

- ☐ F^{-1}
- ☐ Cl^{-1}
- ☐ Br^{-1}
- ☐ I^{-1}

Name: _____

Question 13

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

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

Question 14

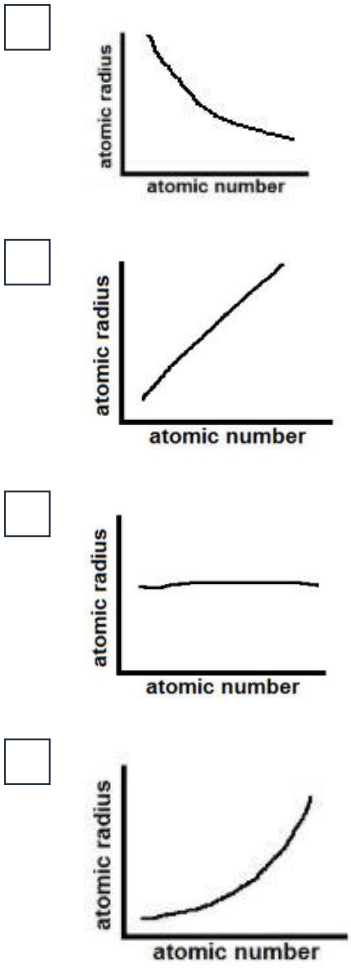
Which of these elements has the smallest atomic radius?

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

Name: _____

Question 15

Which graph represents the correct trend in atomic radius across a period?



Name: _____

Question 16

Compared to the size of a sodium atom, a magnesium atom would have –

- ☐ a larger atomic radius
- ☐ one half the atomic radius
- ☐ a smaller atomic radius
- ☐ double the atomic radius

Question 17

Which of the following statements is true?

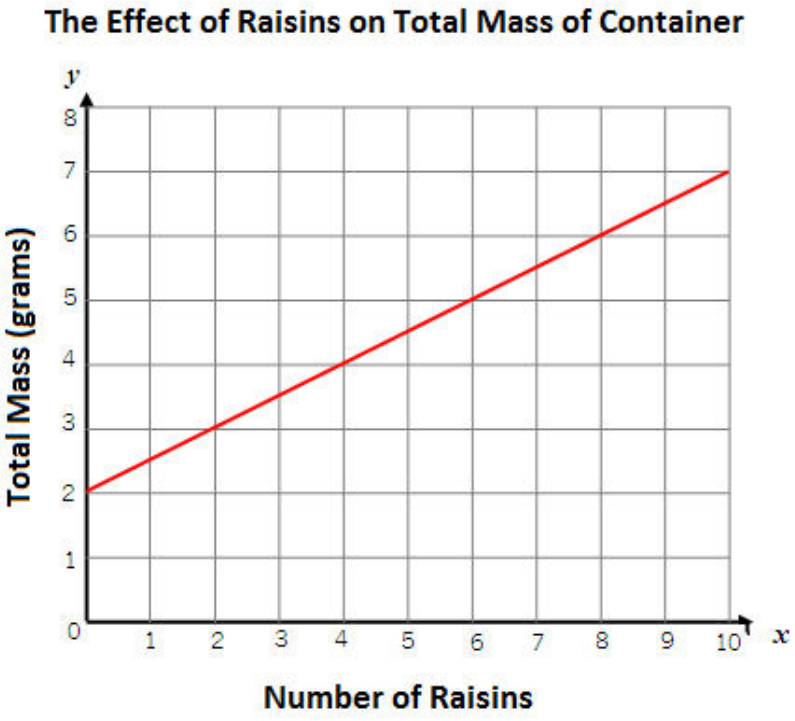
- ☐ The larger the atomic radius, the lower the ionization energy.
- ☐ The smaller the atomic radius, the lower the electronegativity.
- ☐ The smaller the atomic radius, the more reactive the metal.
- ☐ The larger the atomic radius, the smaller the shielding.

Name: _____

Question 18

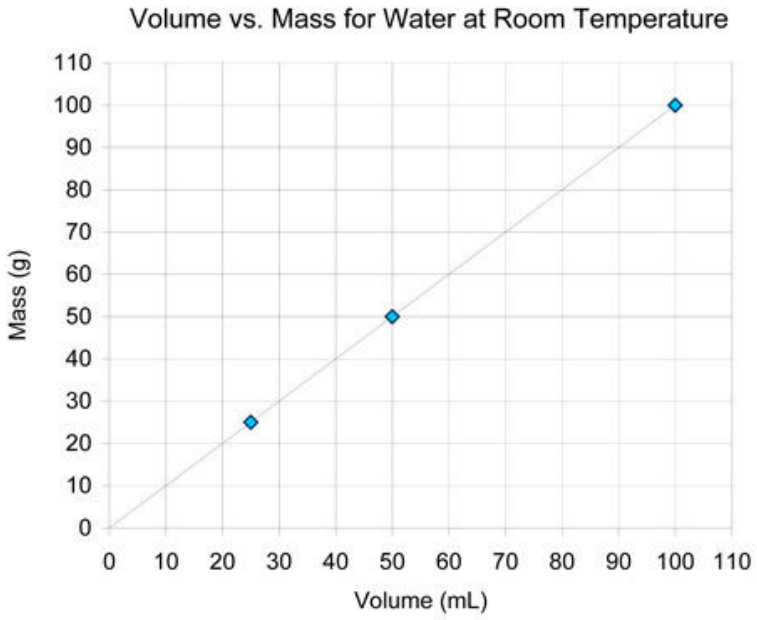
What is the mass of the container, according to the graph below?

_____



Name: _____

Question 19



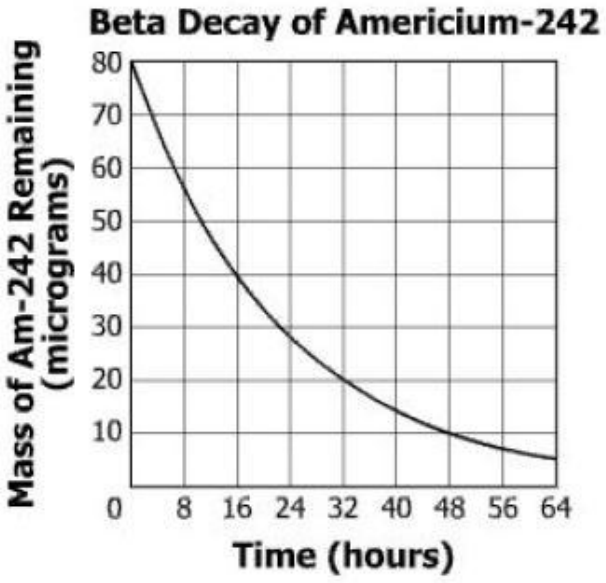
The slope of the best-fit line for this data represents

- ☐ mass
- ☐ density
- ☐ volume
- ☐ temperature

Name: _____

Question 20

What is the half-life of Americium-242?



- ☐ 8 hours
- ☐ 32 hours
- ☐ 16 hours
- ☐ 48 hours

Name: _____

Question 21

Which subatomic particle is responsible for determining an elements chemical properties?

- ☐ protons
- ☐ electrons
- ☐ neutrons
- ☐ ions

Question 22

How many valence electrons does a sulfur atom contain?

- ☐ 16
- ☐ 4
- ☐ 32
- ☐ 6

Name: _____

Question 23

Which combination of atoms will form a covalent bond?

- ☐ Na and Cl
- ☐ H and O
- ☐ Cu and Zn
- ☐ Fr and F

Question 24

Which of the following elements has a full octet?

- ☐ Ca
- ☐ Fe
- ☐ Al
- ☐ Ne

Name: _____

Question 25

Which combination of atoms will form an ionic bond?

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

Question 26

Which of the following statements is true about metal ions?

- ☐ Metals gain electrons to complete their valence orbital and satisfy the octet rule.
- ☐ 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 lose electrons in their inner core orbitals in order to satisfy the octet rule.

Name: _____

Question 27

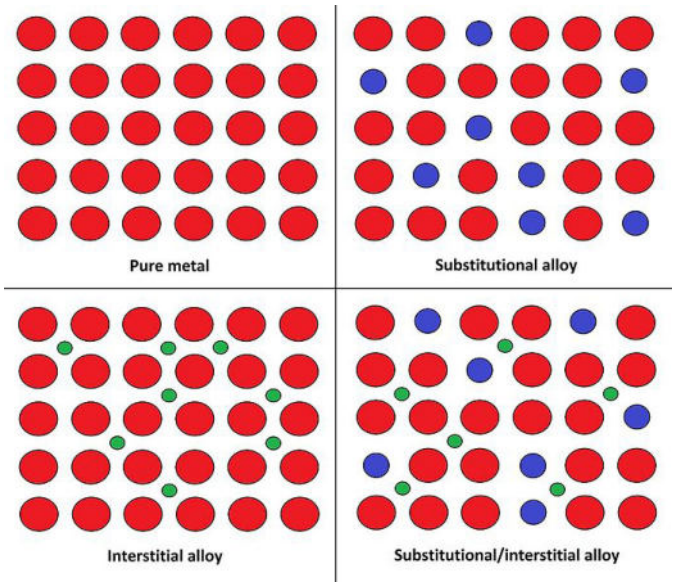
As elements in Group 2 are considered top to bottom, their Metallic Properties -

- ☐ increase
- ☐ decrease
- ☐ stay the same

Name: _____

Question 28

An alloy composed of two different sized atoms is called



- [ ] a pure metal
- [ ] an interstitial alloy
- [ ] a substitutional alloy
- [ ] a constitutional alloy

Name: _____

Question 29

Which properties are most common in nonmetal atoms?

- ☐ low ionization energy and low electronegativity
- ☐ high ionization energy and low electronegativity
- ☐ low ionization energy and high electronegativity
- ☐ high ionization energy and high electronegativity

Question 30

Which of the following elements is a metal?

- ☐ P
- ☐ Ne
- ☐ K
- ☐ O

Name: _____

Question 31

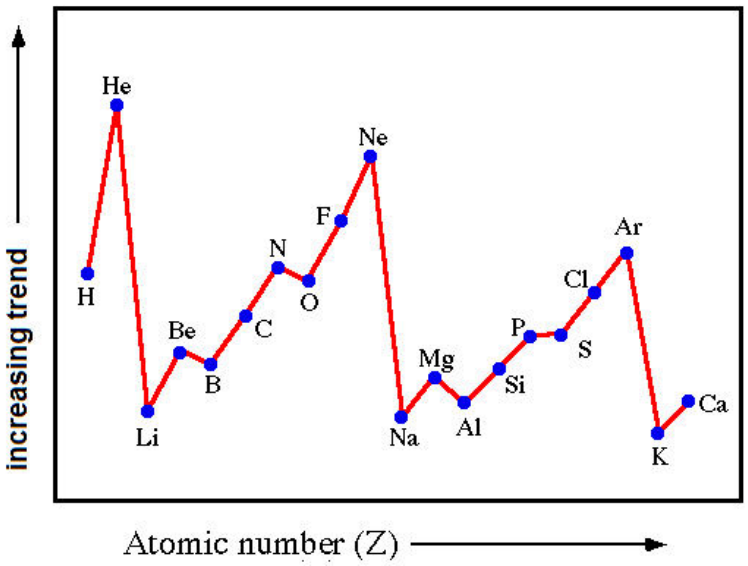
Which periodic trend is a measure of the energy required to remove a valence electron?

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

Name: _____

Question 32

The diagram below represents the periodic trend for _____.



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

Name: _____

Question 33

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

- ☐ Be
- ☐ Ca
- ☐ Mg
- ☐ Sr

Question 34

Why does fluorine have a higher ionization energy than iodine?

- ☐ Fluorine has a greater shielding effect than iodine.
- ☐ Fluorine and iodine have similar chemical properties because they are halogens.
- ☐ Fluorine's smaller atomic radius exerts greater pull on valence electrons.
- ☐ Fluorine and iodine are both nonmetals.

Name: _____

Question 35

Which group has the highest ionization energy?

- ☐ Metalloids
- ☐ Alkali Metals
- ☐ Halogens
- ☐ Nobel Gases

Question 36

Which of the following elements has the highest electronegativity?

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

Name: _____

Question 37

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

- [ ] Magnesium (Mg)
- [ ] Sulfur (S)
- [ ] Aluminum (Al)
- [ ] Argon (Ar)

Question 38

As you move down a group on the periodic table, the electronegativity tends to

- [ ] decrease
- [ ] stays constant
- [ ] increase
- [ ] uctuate

Name: _____

Question 39

Which of the following are ranked according to increasing electronegativity?

- ☐ O < C < Al < K
- ☐ F < Cl < Br < I
- ☐ Ne < Al < S < O
- ☐ Sb < Se < Cl < Ne

Question 40

As you go from left to right across the periodic table,

- ☐ electronegativity decreases and atomic radius decreases.
- ☐ electronegativity increases and atomic radius decreases.
- ☐ electronegativity decreases and atomic radius increases.
- ☐ electronegativity increases and atomic radius increases.

Name: _____

Question 41

How many signi cant digits are in the measurement 0.03070 g?

- ☐ 6
- ☐ 5
- ☐ 3
- ☐ 4

Question 42

How many signi cant digits are in the measurement 1250 ml?

- ☐ 2
- ☐ infinite
- ☐ 3
- ☐ 4

Name: _____

Question 43

Mutliple Response Question:

Which of the following values contains three significant figures?

- [ ] 1050
- [ ] 23.0
- [ ] 240
- [ ] 0.0350

Question 44

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

- [ ] more shielding
- [ ] less shielding
- [ ] the same amount of shielding

Name: _____

Question 45

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

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

Question 46

As you move down a group, shielding

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

Name: _____

Question 47

An electron in an atom's outer shell is shielded from the nucleus by

- ☐ neutrons inside the nucleus
- ☐ electrons in the inner orbitals
- ☐ protons inside the nucleus
- ☐ electrons of other atoms

Question 48

When moving from left to right across the periodic table, the shielding effect

- ☐ increases due to increased atomic number.
- ☐ remains constant based on the number of energy levels.
- ☐ decreases due to decreased atomic radius.
- ☐ increases or decreases based on the charge of the ion.

Name: _____

Question 49

Ionization energy of an unknown element was calculated three separate times and recorded below:

Trial #	Ionization Energy
1	1430 kJ/mol
2	1447 kJ/mol
3	1479 kJ/mol

The actual ionization energy for magnesium is 1,451 kJ/mol. The results can be classified as

- ☐ precise but not accurate
- ☐ accurate but not precise
- ☐ both accurate and precise
- ☐ neither accurate nor precise

Name: _____

Question 50

Three different people weigh a standard mass of 2.00 g on the same balance. Each person obtains a reading of exactly 1.82 g for the mass of the standard. These results imply that the balance that was used is:

- ☐ precise but not accurate
- ☐ both accurate and precise
- ☐ accurate but not precise
- ☐ neither accurate nor precise

Answer Key

Possible Points: 50 Factor: x2.00 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

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

☑ Dmitri Mendeleev

1 possible pts.

Question 2

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: 50 Factor: x2.00 Test Value: 100

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Classify the following information: "The atomic number increases across a period."

☑ QuaLitative

1 possible pts.

Question 4

Classify the following information: "A p-orbital can hold up to six electrons."

☑ QuaNtitative

1 possible pts.

Question 5

Classify the following information: "An alloy is a mixture of two or more metals."

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Answer Key

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Question 6

Classify the following information: "The pH indicator turned the solution blue."

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1 possible pts.

Question 7

Classify the following information: "Temperature is related to the average kinetic energy."

☑ QuaLitative

1 possible pts.

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Which cation will have the largest radius?

☑ Na^{+1}

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 9

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

☑ Nobel gases form the largest ions.

1 possible pts.

Question 10

When an oxygen atom becomes an ion, it has _____ electrons than protons.

☑ 2 more

1 possible pts.

Question 11

Which cation will have the largest radius?

☑ Rb^{+1}

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 12

Which anion will have the largest radius?

☑ I^{-1}

1 possible pts.

Question 13

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

☑ increased shielding effect

1 possible pts.

Question 14

Which of these elements has the smallest atomic radius?

☑ Oxygen (O)

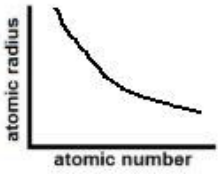
1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 15

Which graph represents the correct trend in atomic radius across a period?

☑ 

1 possible pts.

Question 16

Compared to the size of a sodium atom, a magnesium atom would have –

☑ a smaller atomic radius

1 possible pts.

Question 17

Which of the following statements is true?

☑ The larger the atomic radius, the lower the ionization energy.

1 possible pts.

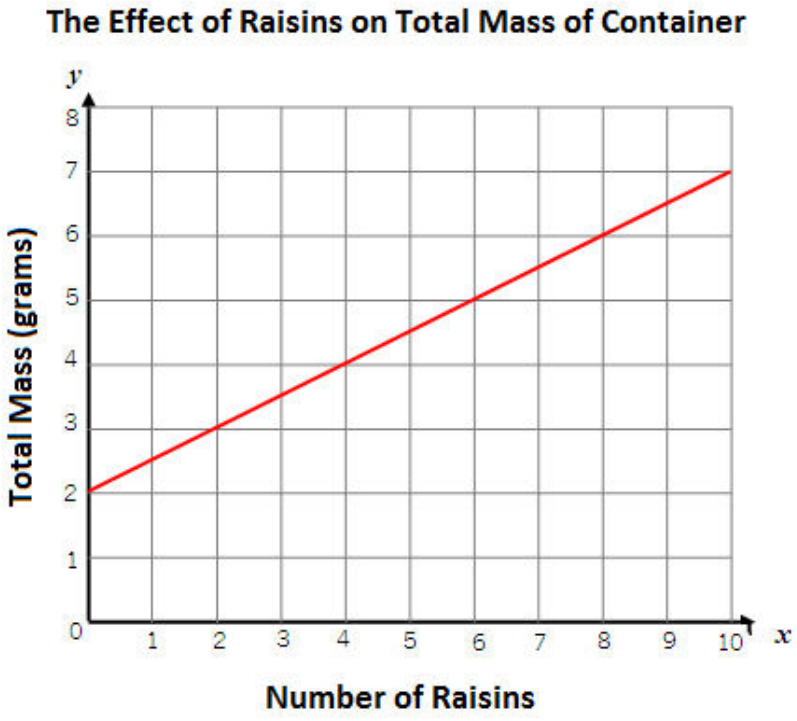
Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 18

What is the mass of the container, according to the graph below?

2 g, 2g, 2grams, 2 grams

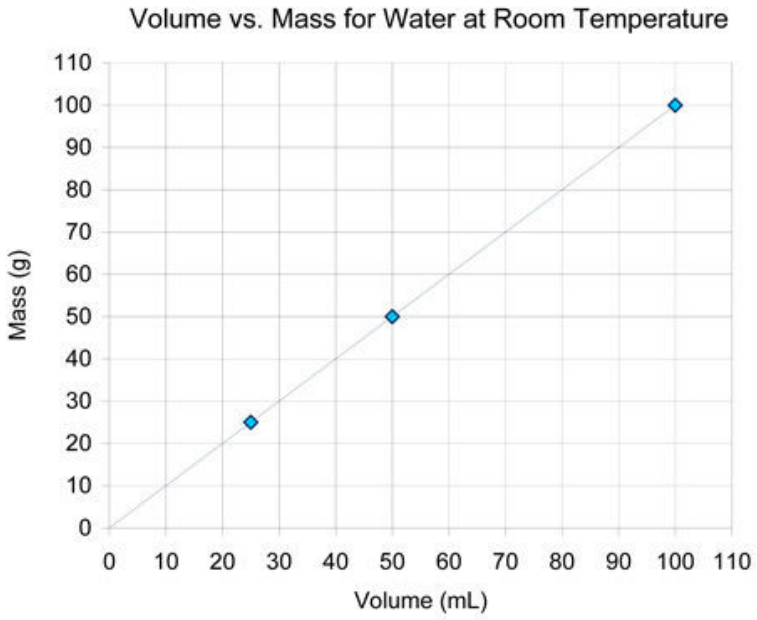


1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 19



The slope of the best-fit line for this data represents

☑ density

1 possible pts.

Answer Key

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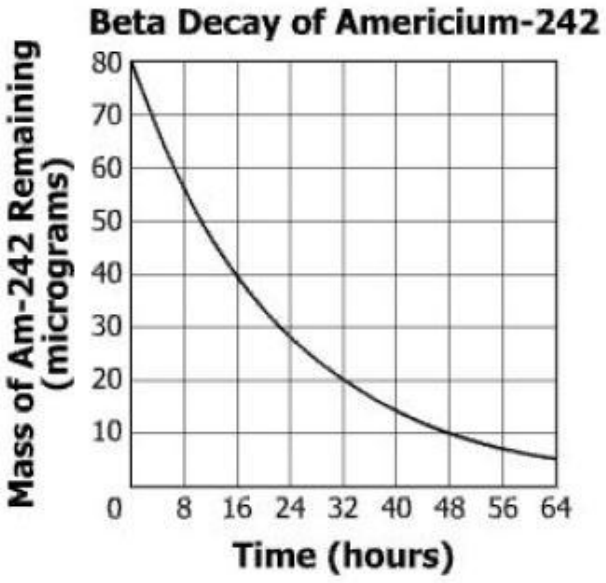
Question 20

What is the half-life of Americium-242?



☑ 16 hours

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 21

Which subatomic particle is responsible for determining an elements chemical properties?

☑ electrons

1 possible pts.

Question 22

How many valence electrons does a sulfur atom contain?

☑ 6

1 possible pts.

Question 23

Which combination of atoms will form a covalent bond?

☑ H and O

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 24

Which of the following elements has a full octet?

☑ Ne

1 possible pts.

Question 25

Which combination of atoms will form an ionic bond?

☑ Mg and Cl

1 possible pts.

Question 26

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: 50 Factor: x2.00 Test Value: 100

Question 27

As elements in Group 2 are considered top to bottom, their Metallic Properties -

☑ increase

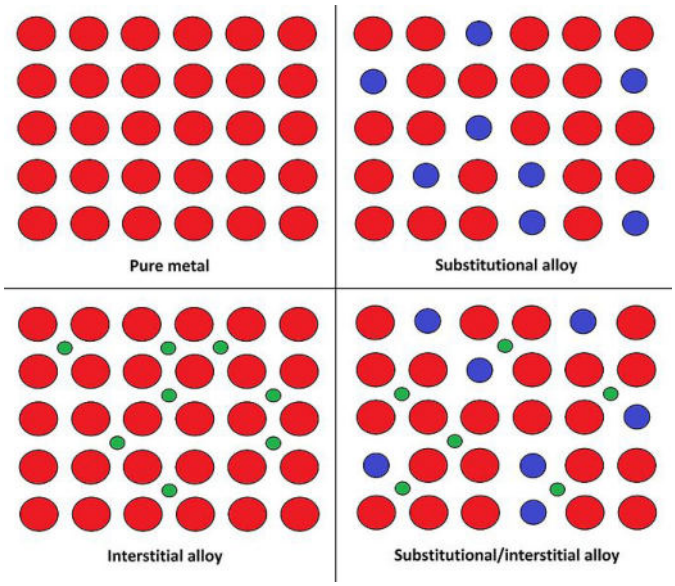
1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 28

An alloy composed of two different sized atoms is called



- [x] a pure metal
- [x] an interstitial alloy

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 29

Which properties are most common in nonmetal atoms?

☑ high ionization energy and high electronegativity

1 possible pts.

Question 30

Which of the following elements is a metal?

☑ K

1 possible pts.

Question 31

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

☑ Ionization Energy

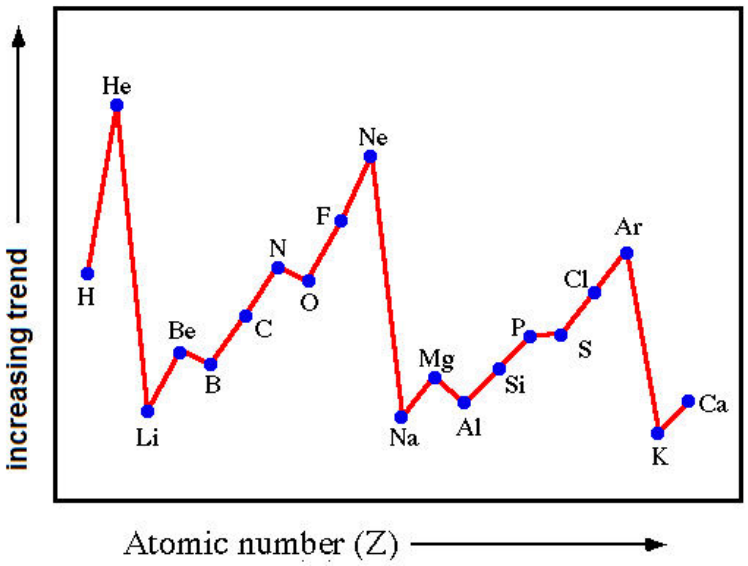
1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 32

The diagram below represents the periodic trend for _____.



☑ Ionization Energy

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 33

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

☑ Sr

1 possible pts.

Question 34

Why does fluorine have a higher ionization energy than iodine?

☑ Fluorine's smaller atomic radius exerts greater pull on valence electrons.

1 possible pts.

Question 35

Which group has the highest ionization energy?

☑ Nobel Gases

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 36

Which of the following elements has the highest electronegativity?

☑ Nitrogen (N)

1 possible pts.

Question 37

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

☑ Argon (Ar)

1 possible pts.

Question 38

As you move down a group on the periodic table, the electronegativity tends to

☑ decrease

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 39

Which of the following are ranked according to increasing electronegativity?

☑ Ne < Al < S < O

1 possible pts.

Question 40

As you go from left to right across the periodic table,

☑ electronegativity increases and atomic radius decreases.

1 possible pts.

Question 41

How many significant digits are in the measurement 0.03070 g?

☑ 4

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 42

How many significant digits are in the measurement 1250 ml?

- [x] 3

1 possible pts.

Question 43

Mutliple Response Question:

Which of the following values contains three significant figures?

** Hint: Multiple Response Questions have more than one correct answer. A clue that more than one response is expected is the square check boxes versus the round dot boxes for single response questions.*

- [x] 1050
- [x] 23.0
- [x] 0.0350

1 possible pts. / partial credit

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 44

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

☑ more shielding

1 possible pts.

Question 45

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.

Question 46

As you move down a group, shielding

☑ increases because atoms contain more core orbitals.

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 47

An electron in an atom's outer shell is shielded from the nucleus by

☑ electrons in the inner orbitals

1 possible pts.

Question 48

When moving from left to right across the periodic table, the shielding effect

☑ remains constant based on the number of energy levels.

1 possible pts.

Answer Key

Possible Points: 50 Factor: x2.00 Test Value: 100

Question 49

Ionization energy of an unknown element was calculated three separate times and recorded below:

Trial #	Ionization Energy
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The actual ionization energy for magnesium is 1,451 kJ/mol. The results can be classified as

☑ accurate but not precise

1 possible pts.

Question 50

Three different people weigh a standard mass of 2.00 g on the same balance. Each person obtains a reading of exactly 1.82 g for the mass of the standard. These results imply that the balance that was used is:

☑ precise but not accurate

1 possible pts.