Deep Run High School

CHEMISTRY I HON: 2(A)

Unit 4 Test

Due Date: **November 25, 2019**

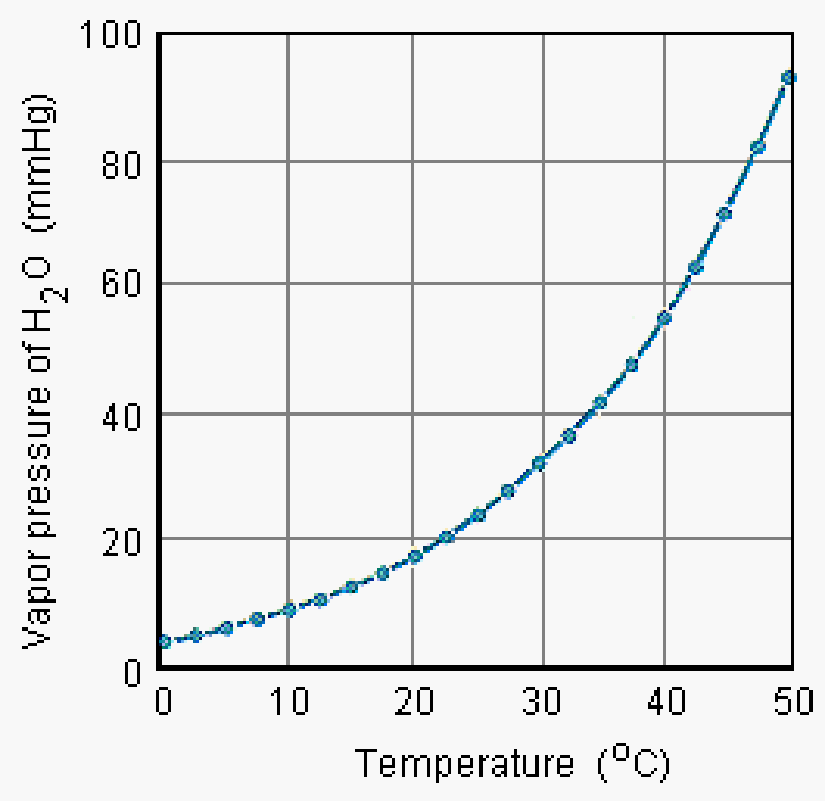
Instructor: **Jennifer Krug**

ID: **3415**

Name: _____ Score: / 100

Question 1

According to the graph below, what is the vapor pressure when the temperature is 40 °C?



- ☐ 27 mm Hg
- ☐ 56 mm Hg
- ☐ 48 mm Hg
- ☐ 35 mm Hg

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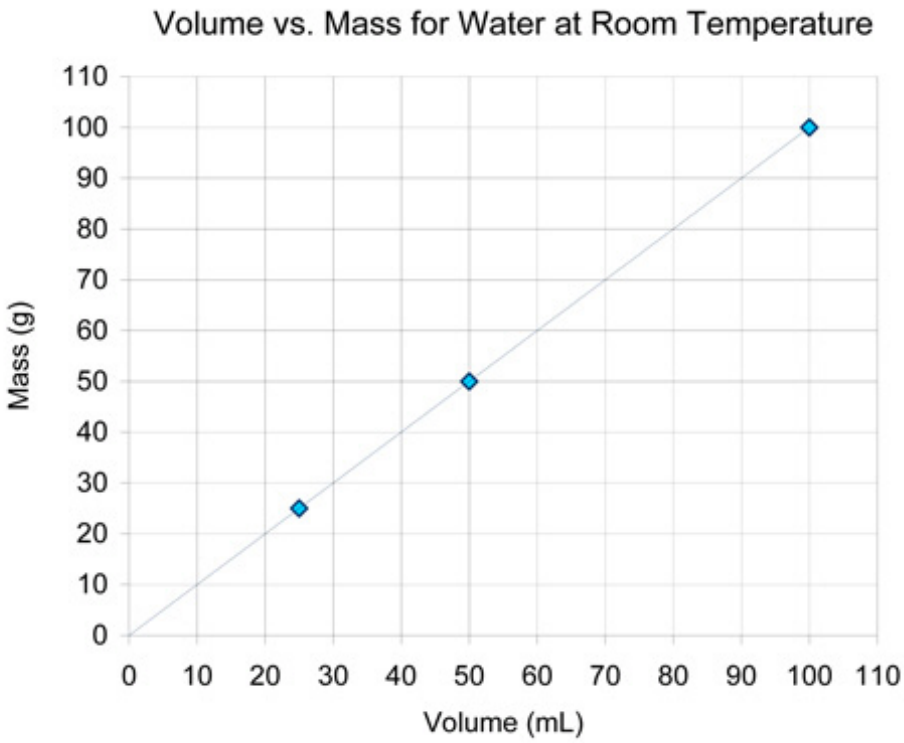
Question 2



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

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

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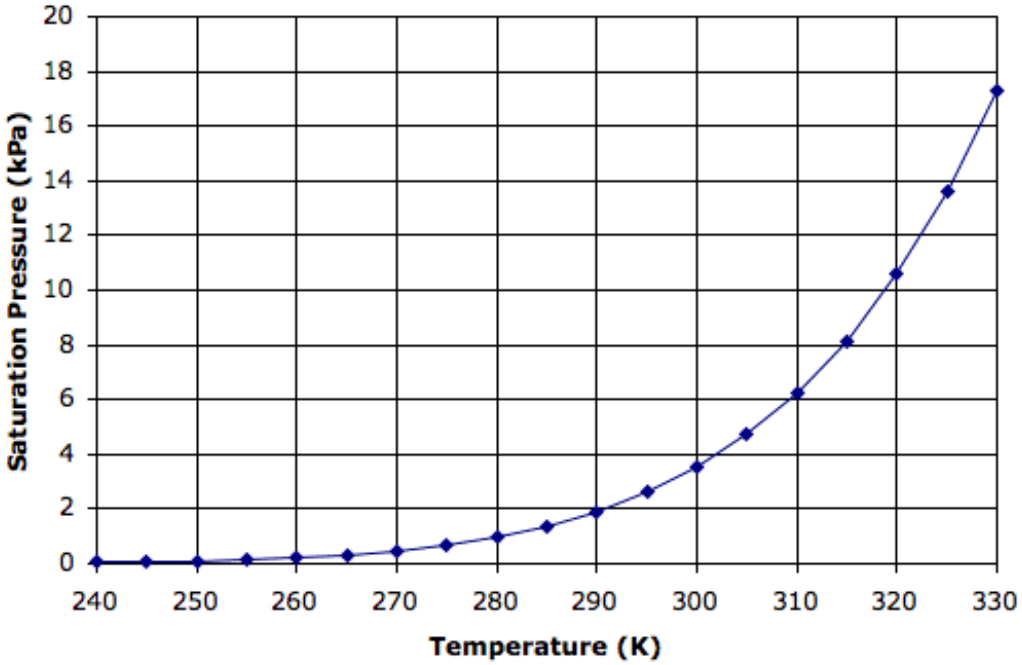
Question 3

According to the graph shown below, when the saturation pressure changes from 2 kPa to 6 kPa, the temperature -



- ☐ increases 20 degrees
- ☐ increases 310 degrees
- ☐ decreases 290 degrees
- ☐ decreases 20 degrees

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Question 4

How many signifcant figures are in the number 6.02×10^{23}?

- [ ] 3
- [ ] 5
- [ ] infinite
- [ ] 2

Question 5

Which of the following density measurements contains only 2 significant figures?

- [ ] 0.025 g/ml
- [ ] 2.500 g/ml
- [ ] 2.50×10^{-2} g/ml
- [ ] 25.00 g/ml

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Question 6

How many significant digits are in the measurement 1250 ml?

- ☐ 2
- ☐ infinite
- ☐ 4
- ☐ 3

Question 7

Which of the following elements is a metal?

- ☐ P
- ☐ Ne
- ☐ O
- ☐ K

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Question 8

As elements in Group 14 are considered top to bottom, their Metallic Properties -

- ☐ increase
- ☐ stay the same
- ☐ decrease

Question 9

Which of the following elements is the most reactive?

- ☐ Rb
- ☐ Mg
- ☐ K
- ☐ Ca

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Question 10

Which properties are most common in nonmetal atoms?

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

Question 11

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

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Question 12

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

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

Question 13

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

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

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Question 14

Which of the following elements has a full octet?

- ☐ Ca
- ☐ Fe
- ☐ Ne
- ☐ Al

Question 15

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

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

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Question 16

Which combination of atoms will form a covalent bond?

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

Question 17

Which group loses 1 valence electron to create a stable cation?

- ☐ Alkali Metals
- ☐ Halogens
- ☐ Noble Gases
- ☐ Alkaline Earth Metals

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Question 18

How many valence electrons does a sulfur atom contain?

- ☐ 16
- ☐ 4
- ☐ 6
- ☐ 32

Question 19

Which group has the highest ionization energy?

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

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Question 20

Which sequence of elements is arranged in order of decreasing ionization energy?

- ☐ Na, Si, Cl
- ☐ Br, Cl, F
- ☐ Ar, Ne, He
- ☐ Be, Mg, Ca

Question 21

Which alkali metal has the highest first ionization energy?

- ☐ Na
- ☐ Rb
- ☐ Cs
- ☐ K

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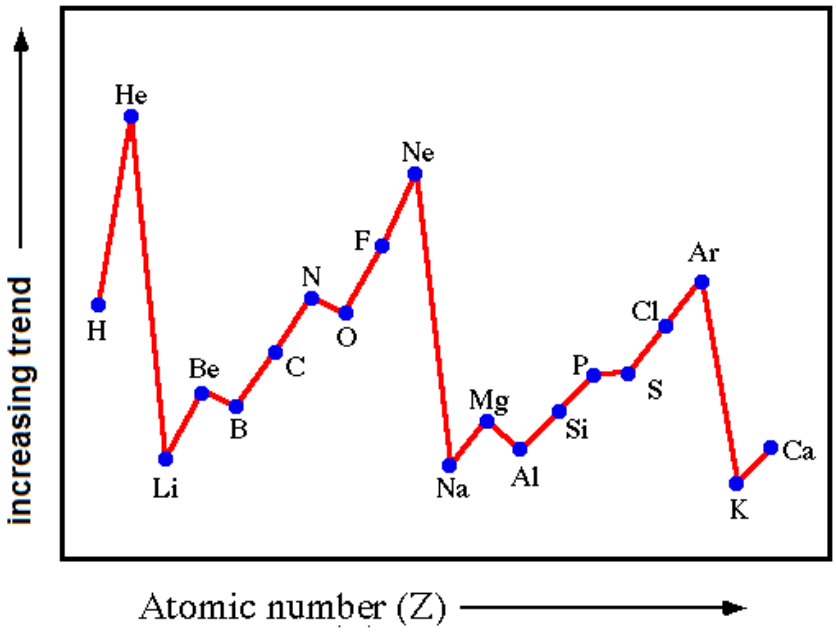
Name: _____

Question 22

The diagram below represents the periodic trend for _____.



- [ ] Ionization Energy
- [ ] Metallic Properties
- [ ] Atomic Radii
- [ ] Electronegativity

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Name: _____

Question 23

Which sequence of elements is arranged in order of *increasing* ionization energy?

- ☐ Li, C, F
- ☐ O, S, Se
- ☐ Al, Mg, Na
- ☐ Cl, S, P

Question 24

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

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

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Name: _____

Question 25

Classify the following information: "The temperature is thirty degrees Celsius."

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

Question 26

Classify the following information: "High carbon steel contains 0.6% - 1.5% carbon."

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

Question 27

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

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

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Name: _____

Question 28

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

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

Question 29

A refridgerator has a set point temperature of 38 °C. The actual temperature is tested every day for three days and recorded in the table below:

Day #	Temperature (°C)
1	37.9
2	38.1
3	38.0

Based on the results the data is

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

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Name: _____

Question 30

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
- ☐ neither accurate nor precise
- ☐ both accurate and precise

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Question 31

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 larger the atomic radius, the smaller the shielding.
- ☐ The smaller the atomic radius, the more reactive the metal.

Question 32

Which of the following causes the atomic radii to get smaller as you move left to right across the periodic table?

- ☐ Radioactivity of the nucleus
- ☐ Shielding Effect
- ☐ Electromagnetic Force
- ☐ Electron-electron repulsion

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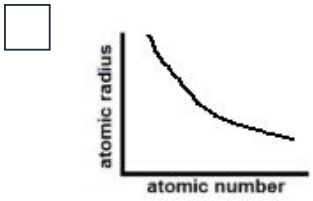
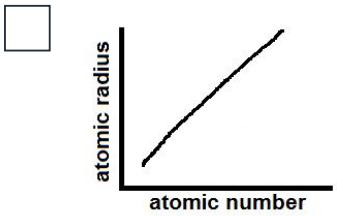
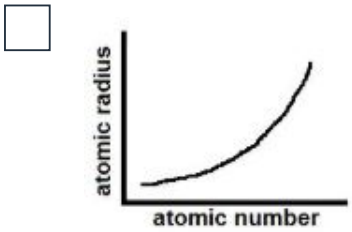
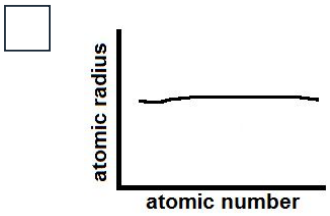
Question 33

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









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Question 34

Compared to the size of a Chlorine (Cl) atom , a Sulfur (S) atom would have –

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

Question 35

Which of these elements has the smallest atomic radius?

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

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Question 36

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.
- ☐ increases or decreases based on the charge of the ion.
- ☐ decreases due to decreased atomic radius.

Question 37

All of the following trends increase as shielding increases *EXCEPT* –

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

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Question 38

Which metalloid has the weakest shielding effect?

- ☐ Boron (B)
- ☐ Arsenic (As)
- ☐ Tellurium (Te)
- ☐ Silicon (Si)

Question 39

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

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

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Question 40

Which of the following trends *decreases* as shielding increases?

- ☐ Atomic Radii
- ☐ Metallic Properties
- ☐ Electronegativity
- ☐ Ionic Radii

Question 41

Which anion will have the largest radius?

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

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Question 42

Which of the following is true of the Ionic Radii trend?

- [ ] Nobel gases form the largest ions.
- [ ] Metals get smaller when they become cations.
- [ ] Cations are always smaller than anions.
- [ ] Nonmetals get smaller when they become anions.

Question 43

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

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

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Question 44

Which anion will have the largest radius?

- ☐ Cl^{-1}
- ☐ O^{-2}
- ☐ N^{-3}
- ☐ S^{-2}

Question 45

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

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

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Question 46

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

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

Question 47

Which periodic trend is a measure of the tendency of an atom to attract a bonding pair of electrons?

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

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Name: _____

Question 48

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

- [ ] decrease
- [ ] stays constant
- [ ] fluctuate
- [ ] increase

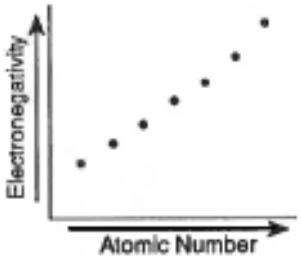
Question 49

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

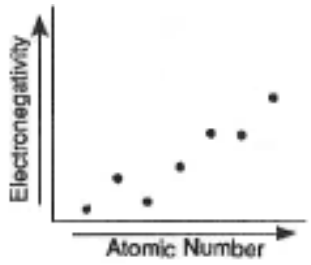
- [ ] Magnesium (Mg)
- [ ] Sulfur (S)
- [ ] Argon (Ar)
- [ ] Aluminum (Al)

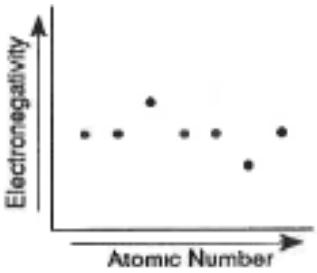
Question 50

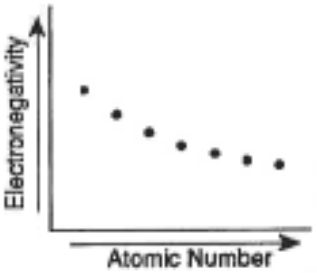
Which diagram correctly shows the relationship between electronegativity and atomic number for the elements of Period 3?

- [ ] 

- [ ]


Electronegativity
Atomic Number


Electronegativity
Atomic Number


Electronegativity
Atomic Number

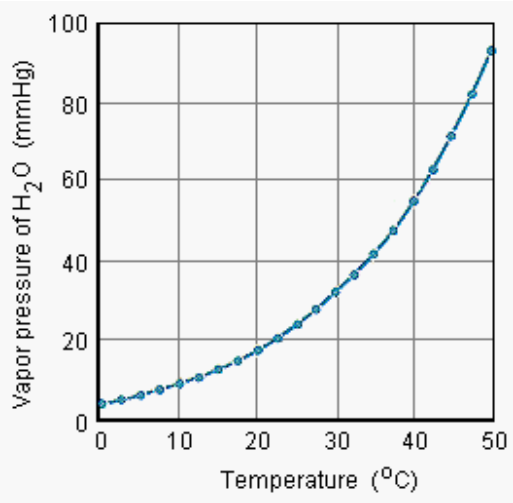
Answer Key

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

According to the graph below, what is the vapor pressure when the temperature is 40 °C?



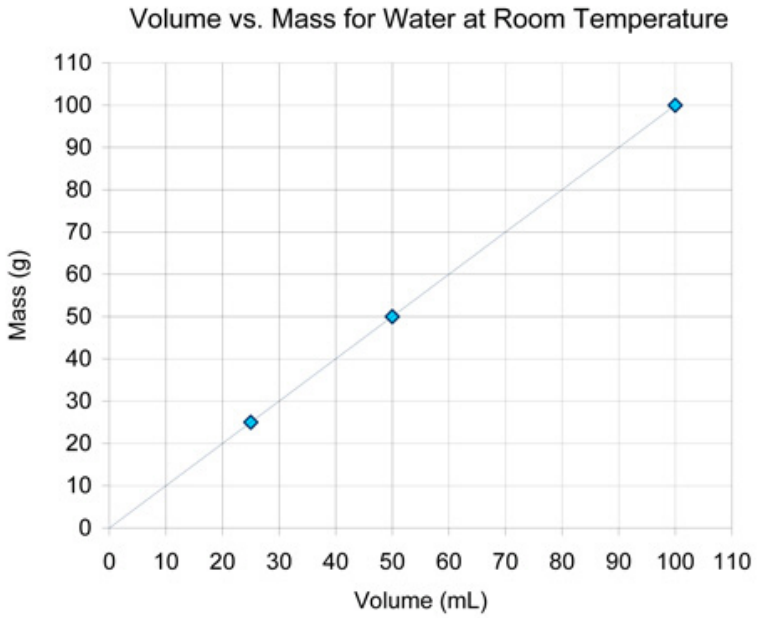
☑ 56 mm Hg

1 possible pts.

Answer Key

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

Question 2



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

☑ density

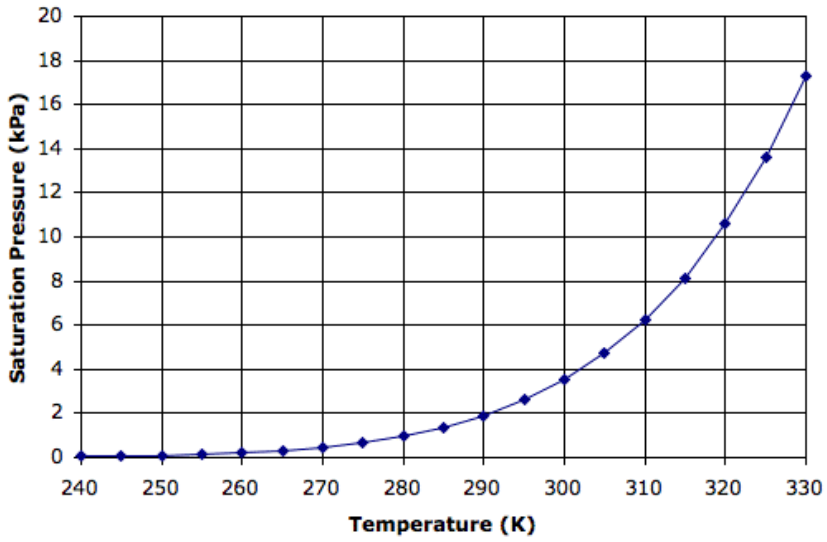
1 possible pts.

Answer Key

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

Question 3

According to the graph shown below, when the saturation pressure changes from 2 kPa to 6 kPa, the temperature -



☑ increases 20 degrees

1 possible pts.

Answer Key

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

Question 4

How many signifcant figures are in the number 6.02×10^{23}?

☑ 3

1 possible pts.

Question 5

Which of the following density measurements contains only 2 significant figures?

☑ 0.025 g/ml

1 possible pts.

Question 6

How many significant digits are in the measurement 1250 ml?

☑ 3

1 possible pts.

Answer Key

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

Question 7

Which of the following elements is a metal?

☑ K

1 possible pts.

Question 8

As elements in Group 14 are considered top to bottom, their Metallic Properties -

☑ increase

1 possible pts.

Question 9

Which of the following elements is the most reactive?

☑ Rb

1 possible pts.

Answer Key

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

Question 10

Which properties are most common in nonmetal atoms?

☑ high ionization energy and high electronegativity

1 possible pts.

Question 11

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.

Question 12

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

Question 13

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

☑ Dmitri Mendeleev

1 possible pts.

Question 14

Which of the following elements has a full octet?

☑ Ne

1 possible pts.

Question 15

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

☑ electrons

1 possible pts.

Answer Key

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

Question 16

Which combination of atoms will form a covalent bond?

☑ H and O

1 possible pts.

Question 17

Which group loses 1 valence electron to create a stable cation?

☑ Alkali Metals

1 possible pts.

Question 18

How many valence electrons does a sulfur atom contain?

☑ 6

1 possible pts.

Answer Key

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

Question 19

Which group has the highest ionization energy?

☑ Nobel Gases

1 possible pts.

Question 20

Which sequence of elements is arranged in order of decreasing ionization energy?

☑ Be, Mg, Ca

1 possible pts.

Question 21

Which alkali metal has the highest first ionization energy?

☑ Na

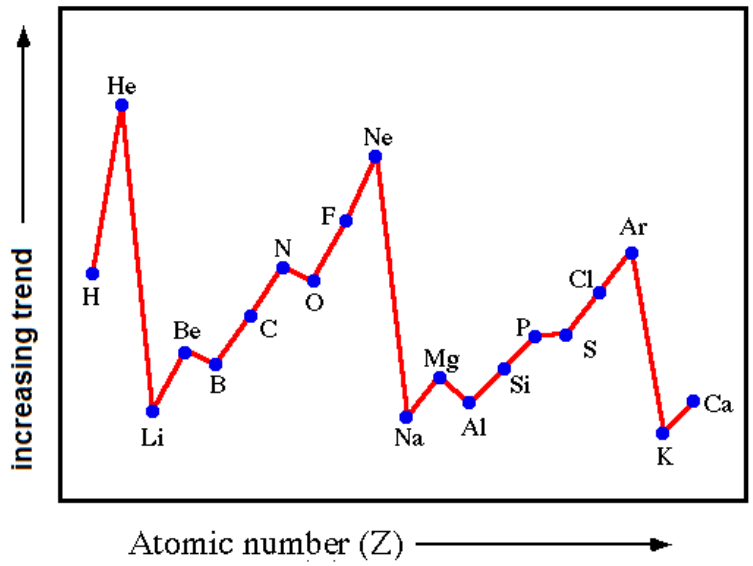
1 possible pts.

Answer Key

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

Question 22

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 23

Which sequence of elements is arranged in order of *increasing* ionization energy?

☑ Li, C, F

1 possible pts.

Question 24

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

☑ Qua**L**itative

1 possible pts.

Question 25

Classify the following information: "The temperature is thirty degrees Celsius."

☑ Qua**N**titative

1 possible pts.

Answer Key

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

Question 26

Classify the following information: "High carbon steel contains 0.6% - 1.5% carbon."

☑ QuaNtitative

1 possible pts.

Question 27

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

☑ QuaLitative

1 possible pts.

Question 28

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

☑ QuaLitative

1 possible pts.

Answer Key

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

Question 29

A refridgerator has a set point temperature of 38 °C. The actual temperature is tested every day for three days and recorded in the table below:

Day #	Temperature (°C)
1	37.9
2	38.1
3	38.0

Based on the results the data is

☑ both accurate and precise

1 possible pts.

Answer Key

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

Question 30

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

☑ accurate but not precise

1 possible pts.

Question 31

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 32

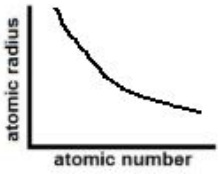
Which of the following causes the atomic radii to get smaller as you move left to right across the periodic table?

☑ Electromagnetic Force

1 possible pts.

Question 33

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

☑ 

1 possible pts.

Answer Key

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

Question 34

Compared to the size of a Chlorine (Cl) atom , a Sulfur (S) atom would have –

☑ a larger atomic radius

1 possible pts.

Question 35

Which of these elements has the smallest atomic radius?

☑ Oxygen (O)

1 possible pts.

Question 36

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 37

All of the following trends increase as shielding increases *EXCEPT* –

☑ Ionization Energy

1 possible pts.

Question 38

Which metalloid has the weakest shielding effect?

☑ Boron (B)

1 possible pts.

Question 39

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: 50 Factor: x2.00 Test Value: 100

Question 40

Which of the following trends *decreases* as shielding increases?

☑ Electronegativity

1 possible pts.

Question 41

Which anion will have the largest radius?

☑ I^{-1}

1 possible pts.

Question 42

Which of the following is true of the Ionic Radii trend?

☑ Metals get smaller when they become cations.

1 possible pts.

Answer Key

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

Question 43

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

☑ 2 more

1 possible pts.

Question 44

Which anion will have the largest radius?

☑ S^{-2}

1 possible pts.

Question 45

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

☑ Nobel gases form the largest ions.

1 possible pts.

Answer Key

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

Question 46

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

☑ electronegativity increases and atomic radius decreases.

1 possible pts.

Question 47

Which periodic trend is a measure of the tendency of an atom to attract a bonding pair of electrons?

☑ Electronegativity

1 possible pts.

Question 48

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 49

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

☑ Argon (Ar)

1 possible pts.

Question 50

Which diagram correctly shows the relationship between electronegativity and atomic number for the elements of Period 3?

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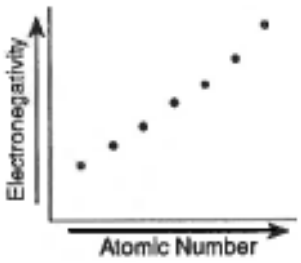

1 possible pts.