

Periodic Trends Worksheet

- 1) Rank the following elements by increasing atomic radius: carbon, aluminum, oxygen, potassium.

- 2) Rank the following elements by increasing electronegativity: sulfur, oxygen, neon, aluminum.

- 3) What is the difference between electron affinity and ionization energy?

- 4) Why does fluorine have a higher ionization energy than iodine?

- 5) Why do elements in the same family generally have similar properties?

Electron Configurations Worksheet

Write the complete ground state electron configurations for the following:

- 1) lithium _____
- 2) oxygen _____
- 3) calcium _____
- 4) titanium _____
- 5) rubidium _____
- 6) lead _____
- 7) erbium _____

Write the abbreviated ground state electron configurations for the following:

- 8) helium _____
- 9) nitrogen _____
- 10) chlorine _____
- 11) iron _____
- 12) zinc _____
- 13) barium _____
- 14) polonium _____

Electron Configuration Practice Worksheet

In the space below, write the unabbreviated electron configurations of the following elements:

- 1) sodium _____
- 2) iron _____
- 3) bromine _____
- 4) barium _____
- 5) neptunium _____

In the space below, write the abbreviated electron configurations of the following elements:

- 6) cobalt _____
- 7) silver _____
- 8) tellurium _____
- 9) radium _____
- 10) lawrencium _____

Determine what elements are denoted by the following electron configurations:

- 11) $1s^2 2s^2 2p^6 3s^2 3p^4$ _____
- 12) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^1$ _____
- 13) $[\text{Kr}] 5s^2 4d^{10} 5p^3$ _____
- 14) $[\text{Xe}] 6s^2 4f^{14} 5d^6$ _____
- 15) $[\text{Rn}] 7s^2 5f^{11}$ _____

Determine which of the following electron configurations are not valid:

- 16) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^{10} 4p^5$ _____
- 17) $1s^2 2s^2 2p^6 3s^3 3d^5$ _____
- 18) $[\text{Ra}] 7s^2 5f^8$ _____

19) [Kr] $5s^2 4d^{10} 5p^5$ _____

20) [Xe] _____

Types of Solids Worksheet

Determine if the following compounds are metallic solids, ionic solids, network atomic solids, molecular solids, or amorphous solids based on their properties. These are all actual chemical compounds.

- 1) This material forms crumbly crystals and has a melting point of 16.6° Celsius. It has a low density in solid form.

_____ (acetic acid)

- 2) This material forms very hard colorless crystals. It does not dissolve in water and burns at high temperatures.

_____ (diamond)

- 3) This material forms colorless crystals that have a melting point of 661° C. It is hard, brittle, and dissolves well in water.

_____ (sodium iodide)

- 4) This material forms silver crystals that do not dissolve in water and have a melting point of 1414° C. This material is very hard and is not a good conductor of electricity.

_____ (silicon)

- 5) This material is hard and melts at a temperature of 1610° C. It dissolves only with difficulty in very reactive acids and doesn't conduct electricity when molten. It forms colorless crystals.

_____ (quartz)

- 6) This material is soft and doesn't form crystals. It has a melting point of 660° C. It doesn't dissolve in water. It is used as a structural material in the construction of airplanes and rockets.

_____ (aluminum)

- 7) This material is easily scratched. It is black and has a melting point of 185° C. It is used for applications where lightweight, nonstructural materials are required.

_____ (plastic)

Protons, Neutrons, and Electrons Practice Worksheet

Fill in the blanks in the following worksheet. Please keep in mind that the isotope represented by each space may NOT be the most common isotope or the one closest in atomic mass to the value on the periodic table.

Atomic symbol	Atomic number	Protons	Neutrons	Electrons	Atomic mass
B			6		
	11				24
		31	37		
				39	89
	29		35		
		43			100
Pb					207
			102	70	
		89			225
Mo			53		
	81				206
	100		159		
No					261
Yb					172
		106	159		

Summer Review Sheet #5

The periodic table and oxidation states

Answers are provided on the second sheet. Please try to do the worksheet without referring to them, because you'll be expected to know this stuff the first day of school!

Which group of the periodic table is most likely described by questions 1-5?

- 1) These elements are very strong oxidizers. _____
- 2) These elements have a charge of +2 when forming ionic compounds.

- 3) These elements are almost entirely unreactive. _____
- 4) These elements are radioactive. _____
- 5) These elements are all diatomic. _____
- 6) These elements are found in group 1 of the periodic table. _____
- 7) These elements are rare, have high densities, and are used for various industrial purposes.

For problems 8-11, describe the oxidation state of each element when it forms ionic compounds:

- | | |
|------------------|---------------------|
| 8) oxygen _____ | 10) potassium _____ |
| 9) gallium _____ | 11) nitrogen _____ |

For problems 12-15, determine the number of valence electrons each element has:

- | | |
|------------------|--------------------|
| 12) sulfur _____ | 14) helium _____ |
| 13) carbon _____ | 15) hydrogen _____ |

Electron Configuration Worksheet

Write the unabbreviated electron configurations of the following elements:

- 1) copper _____
- 2) iodine _____
- 3) potassium _____
- 4) bismuth _____
- 5) zirconium _____

Write the abbreviated electron configurations of the following elements:

- 6) iridium _____
- 7) chlorine _____
- 8) nobelium _____
- 9) caesium _____
- 10) magnesium _____

The following electron configurations belong to which elements:

- 11) $1s^2 2s^2 2p^6 3s^1$ _____
- 12) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^6$ _____
- 13) $[\text{Kr}] 5s^2 4d^{10}$ _____
- 14) $[\text{Xe}] 6s^2 4f^{14} 5d^{10} 6p^2$ _____
- 15) $[\text{Rn}] 7s^2 5f^{14} 6d^4$ _____

Determine if the following electron configurations are correct:

- 16) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 4d^{10} 4p^6 5s^1$ _____
- 17) $1s^2 2s^2 2p^6 3s^3$ _____
- 18) $[\text{Rn}] 7s^2 5f^9 6d^2$ _____
- 19) $[\text{Ar}] 5s^2 4d^{10} 5p^5$ _____
- 20) $[\text{Xe}] 6s^2 4f^{10}$ _____

Percent Error Practice

Directions: *For each of the following situations find the percent error involved. Be careful in determining the true vs. observed value.*

1. Samantha S. Sloppiness measured the volume of her soda before she drank it for her midmorning snack. She measured the volume of the 12 oz. bottle to be 14 oz.
2. Clyde Clumsy was directed to weigh a 500 g mass on the balance. After diligently goofing off for ten minutes, he quickly weighed the object and reported 458 g.
3. Pretty Patty Pestilence had casually recorded her grades for the nine weeks in her notebook. She concluded she had 250 points out of 300 for the grading period. However, Miraculous (chem teacher) determined she had 225 points out of 300 and awarded her a "C" for the grading period.
4. Drew D. Dingaling came to Miraculous with a problem. Drew was told to measure 50 cm of copper wire to use in an experiment. Since his ruler only measured to 45 cm he used this amount of wire and his experiment was a failure.
5. Henry Heavyfoot was just arrested for speeding by Officer O'Rourke for traveling 65 mph in a 55 mph zone. Henry claimed his speedometer said 55 mph not 65 mph.
6. Willomina Witty was assigned to determine the density of a sample of nickel metal. When she finished, she reported the density of nickel as 5.59 g/ml. However, Miraculous knew the density of nickel was 6.44 g/ml.
7. An experiment to determine the volume of a "mole" of a gas was assigned to Barry Bungleditup. He didn't read the experiment carefully and concluded the volume was 18.7 liters. Miraculous knew he should have obtained 22.4 liters.

Answers: 1. 16.6%; 2. 8.40%; 3. 11.1%; 4. 10.0%; 5. 15.4%; 6. 13.2%; 7. 16.5%