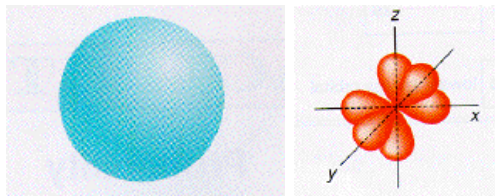


## Review - Section 2A

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

1) Draw a diagram of all the different shapes of an s-orbital and a p-orbital. Label the number of electrons held by each.



2) Write out the configurations for the following elements:

a) Yttrium

$[\text{Kr}] 5s^2 4d^1$

b) Thulium

$[\text{Xe}] 6s^1 4f^{14}$

c) Polonium

$[\text{Xe}] 6s^2 4f^{14} 5d^{10} 6p^4$

d) Calcium

$[\text{Ar}] 4s^2$

e) Lanthanum

$[\text{Xe}] 6s^2 4f^1 5d^1$

f) Rutherfordium

$[\text{Rn}] 7s^2 5f^{14} 6d^2$

3) Draw an orbital diagram for copper:

$1s \uparrow \downarrow \quad 2s \uparrow \downarrow \quad 2p \uparrow \downarrow \quad \uparrow \downarrow \quad \uparrow \downarrow \quad 3s \uparrow \downarrow \quad 3p \uparrow \downarrow \quad \uparrow \downarrow \quad \uparrow \downarrow \quad 4s \uparrow \quad 3d \uparrow \downarrow \quad \uparrow \downarrow \quad \uparrow \downarrow \quad \uparrow \downarrow \quad \uparrow \downarrow$

4) Describe the difference between a chemical and a physical change and give an example of each.

In a physical change, the substance is altered in size or shape, but not in its chemical make up. Examples would be cutting, melting, or smashing. In a chemical change, the substance chemical make up is altered, changing it into a new substance. Examples would be burning, decomposing or decaying.

5) Identify the following elements:

a)  $[\text{Xe}] 6s^1 4f^{14} 5d^5$

tungsten (W)

b)  $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^3$

arsenic (As)

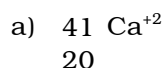
c)  $[\text{Rn}] 7s^2 5f^3$

protactinium (Pa)

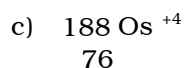
d)  $[\text{Kr}] 5s^2 4d^7$

rhodium (Rh)

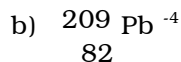
6) Determine the number of protons, neutrons, and electrons in each of the following:



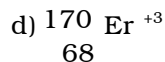
20 protons, 21 neutrons, 18 electrons



76 protons, 112 neutrons, 72 electrons



82 protons, 127 neutrons, 86 electrons

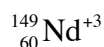


68 protons, 102 neutrons, 65 electrons

7) Write complete chemical symbols for elements with the following sub-atomic particles:

a) 35 protons, 45 neutrons, 36 electrons

b) 60 protons, 89 neutrons, 57 electrons



8) You are given the following elements: silicon, tin, iodine and chlorine. Which of these would have:

a) the largest atomic radius

tin

d) the largest ionic radius

iodine

b) the greatest electronegativity

chlorine

e) the greatest ionization energy

chlorine

c) the smallest electronegativity

tin

f) the smallest ionic radius

silicon

9) Calculate the average atomic mass of the element with the following isotope data, and then identify the element X.

Isotope Number	Mass (amu)	Percent Abundance
X-192	191.961	0.79 %
X-194	193.963	32.9 %
X-195	194.965	33.8 %
X-196	195.965	25.3 %
X-198	197.968	7.2 %

195.061 amu, platinum (Pt)

10) What is the difference between an ion and an isotope?

An ion is an atom that has either gained or lost an electron. An isotope is an atom of an element that has a different number of neutrons than another atom of that element.