ChemI Name _____

Date _____ Per _____

Worksheet # 5 Atomic Structure And Isotopes

1. Draw a picture of an atom of Helium-4 . Label the protons, neutrons, and electrons.

2. What are charges of the three particles that make up an atom?

   a. protons have a _____ charge

   b. neutrons have a _____ charge

   c. electrons have a _____ charge

3. Which of the atomic particles have a mass of one atomic mass unit (amu)?

   _____ and _____

4. Which of the atomic particles has a mass that is 1,836 times smaller than one amu?

   _____

5. The number of _____ in an atom determines what kind of atom it is. This number is the smaller of the two numbers in the boxes on the periodic table is called the atom's _____ number. If the atom is neutral, it's also equal to the number of the atom's electrons.

6. Use a periodic chart to figure out:

   a. what kind of atom has 17 protons in its nucleus? _____

   b. what kind of atom has 79 protons in its nucleus? _____

   c. what kind of atom has 1 proton in its nucleus? _____

   d. what kind of atom has 92 protons in its nucleus? _____

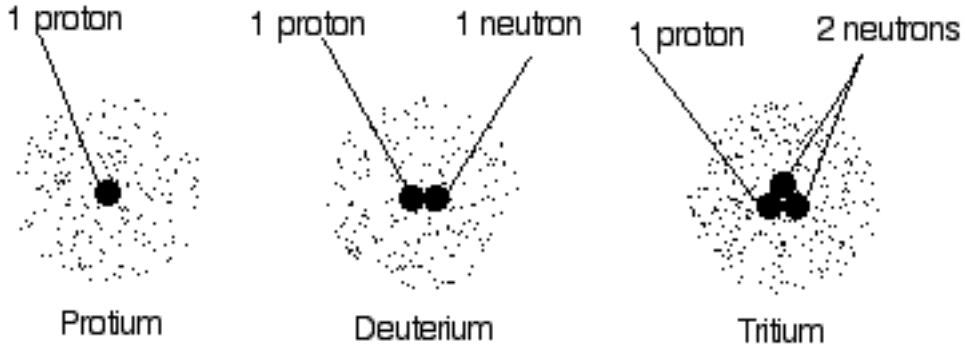
7. The larger of the two numbers in the boxes on the periodic table is called the atomic _____ number.

   a. It equals the the average number of _____ + _____

8. Use a periodic table to complete the following table (assume all the atoms are neutral):

Symbol	# of protons	# of neutrons	# of electrons
ex: F	9	10	9
Mo			
	18		
		8	
			53
U			
	19		

9. Isotopes are atoms of the same element that have different numbers of _____ in their nucleus. Ex: the isotopes of hydrogen are:



10. Use the diagram above to answer the following questions:

a. Name the three isotopes of hydrogen. _____, _____, and _____

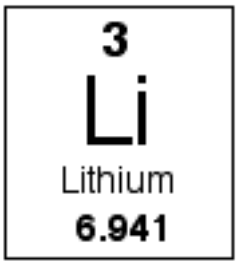
b. Which isotope of hydrogen has the lowest mass? _____ What is its mass? _____ amu

c. Which isotope of hydrogen has the greatest mass? _____ What is its mass? _____ amu

d. Assuming these atoms are neutral, how many electrons does each of them have? _____

e. What do the little dots around the protons and neutrons in these pictures represent?

_____



11. Use the diagram above to answer the following:

a. What does the “3” represent? _____

b. What does the “6.941” represent? _____

c. Does lithium always have to have 3 protons? _____

d. Does lithium always have to have 4 neutrons? _____

e. Why isn’t the 6.941 a whole number? _____

_____

12. The term ”average atomic mass” means the average number of

_____+_____ that an atom has.

13. Given the following: $^{36}_{17}\mathrm{Cl}$, that shows the symbol for one of chlorine’s isotopes,

a. How many protons are in this isotope? _____

b. How many neutrons are in this isotope? _____

14. Complete the following chart (again, assume each of these is neutral):

	# of protons	# of neutrons	# of electrons
$^{24}_{12}$Mg			
	16	18	
		23	21
$^{52}_{24}$Cr			
$^{53}_{24}$Cr			