



### **Atomic Number.**

On the grid above, graph the atomic radius of elements 11 to 20. Label the Y axis, and choose appropriate values. (you need not start at zero) Circle each of your points, and connect them with a smooth curve.

1. What is the general trend as the atomic number increases in period 3?
2. Explain the large change that occurs between element 18 and element 19
3. Which of these elements would be the most active metal? Why?
4. Which is the most active nonmetal? Why?

- \_\_\_\_\_5. Which element in period 4 has 5 valence electrons?
- \_\_\_\_\_6. Which is the most active metal in period 3?
- \_\_\_\_\_7. What is the LEAST reactive element in period 2 ?
- \_\_\_\_\_ 8. Draw the dot structure of a sulfur atom.
- \_\_\_\_\_9. How many neutrons, protons, and electrons are there on the atom  $^{25}\text{Mg}$ ?
- \_\_\_\_\_10. How many electrons are there on an  $\text{Al}^{3+}$  ion ?
- \_\_\_\_\_11. If an ion has a charge of  $3-$  and the configuration 2-8-8 , the ion must have been formed from A) a sulfur atom B) a scandium atom C) a phosphorous atom D) an argon atom
- \_\_\_\_\_12. Assume that nickel consists of two isotopes, one that has a mass of 58.0, and the other a mass of 59.0 . The % of the isotope with the mass of 58.0 in naturally occurring nickel would be closest to A) 50 % B) 30 % C) 70 % D) 10 %
- \_\_\_\_\_13. Isotopes of oxygen atoms can have different A) atomic numbers  
B) mass numbers C) numbers of electrons D) atomic radii
- \_\_\_\_\_14. Which element is considered a metalloid? A) C B) Ar C) Ge D) I
- \_\_\_\_\_15. Which element generally forms compounds that are blue or green?  
A) K B) Ba C) Cu D) S
- \_\_\_\_\_16. How many electrons are there on the SECOND principal energy level of an Ra atom?
- \_\_\_\_\_17. Which element has a lower ionization energy, AND a smaller atomic radius than Phosphorous?
- \_\_\_\_\_18. Elements with the highest ionization energies are found group  
A) 1 B) 14 C) 17 D) 18
- \_\_\_\_\_19. It is most difficult to remove an electron from an atom of  
A) Ba B) S C) Cl D) F

- \_\_\_\_\_20. An orbital is best described as A) a circular path B) a region in the nucleus  
C) a cloud of negative charge, where an electron is likely to be found  
D) a spherical surface
- \_\_\_\_\_21. Which experiment first indicated the existence of a nucleus?
- \_\_\_\_\_22. An electron will release energy when it moves from the third energy level  
A) to the fourth B) to the fifth C) to the second D) completely off the atom
- \_\_\_\_\_23. The most active nonmetals are called the A) noble gases B) halogens  
C) alkali metals D) alkaline earth metals
- \_\_\_\_\_24. Both Fe atoms and Ga atoms often form ions with a charge of 3+. They are  
different, because ONLY the iron atoms A) lose three electrons B) decrease in radius when  
they form the ions C) gain electrons D) lose electrons from two principal energy levels.
- \_\_\_\_\_25. Which ion has the same number of electrons as a  $\text{Cl}^-$  ion?  
A)  $\text{F}^-$  B)  $\text{Mg}^{2+}$  C)  $\text{K}^+$  D)  $\text{Se}^{2-}$
- \_\_\_\_\_26. Which ion is smallest ? A)  $\text{Al}^{3+}$  B)  $\text{Fe}^{2+}$  C)  $\text{O}^{2-}$  D)  $\text{S}^{2-}$
- \_\_\_\_\_27. What is the nuclear charge of a chlorine atom? A) 17 B) 35 C) 18 D) -1
- \_\_\_\_\_28. Within a period, as the atomic number increases, the ionization energy generally...
- \_\_\_\_\_29. As an oxygen atom forms an oxide ion, the radius of the particle...
- \_\_\_\_\_30. As the ionization energy decreases in group 17, the activity of the element....
- \_\_\_\_\_31. What is the mass number of an atom that contains 17 protons, 20 neutrons, and  
17 electrons?