

The following questions are worth 1 point each.

1. Which of the following has the least ionization energy?

- a. Ba
- b. Ca
- c. Ra

decreases down a group

2. Choose the largest element from the following

- a. Cl
- b. P
- c. Na

decreases L → R in a period

3. Which of the following elements has the smallest electronegativity?

- a. Cl
- b. Br
- c. As

*decreases down a group
increases L → R in a period*

Discuss how electrons are allotted among the atoms in the following situations:

- 4. Covalent bond- *electrons shared equally*
- 5. Ionic bond- *electrons transferred*
- 6. Polar covalent bond- *electrons shared unequally*

Use the following choices to classify each of the molecules. Place the capital letter of your choice on the line.

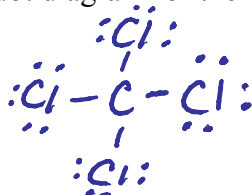
- A. ionic
- B. covalent
- C. polar covalent

- 7. NaCl A
- 8. CO₂ C
- 9. Cl₂ B

10. Draw the Lewis dot diagram for the phosphorus atom.



11. Draw the Lewis dot diagram for the CCl₄ molecule.

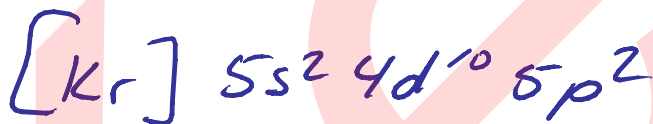


Complete each configuration as indicated. 2 points each.

12. What is the **complete** electron configuration of Silicon (atomic # = 14)



13. What is the **abbreviated** electron configuration of Tin (atomic # = 50)



14. Draw an **orbital diagram** of the electron configuration of cobalt (atomic # = 27)

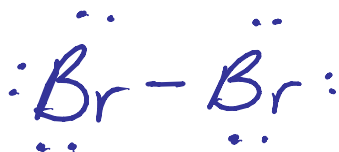


The following questions are worth 2 points each!

15. Draw the Lewis structure for the HF molecule and show the dipole moment if present.



16. Draw the Lewis structure for Br₂ and show the dipole moment if present.



17. Define "ELECTRONEGATIVITY"

the ability of an atom to attract shared electrons

18. Define "IONIZATION ENERGY"

amount of energy needed to remove an electron from the atom

19. What is a "BOND" (define)?

the force that holds 2 or more atoms together causing them to act as a group.

20. What is BOND ENERGY?

amount of energy needed to break a bond

21. What is a "DIPOLE MOMENT" and give an example.

partial charges resulting from unequal sharing of electrons.

22. Explain why the elements in the same group (vertical column) have the same chemical and bonding properties.

they have the same number of valence electrons

23. State the trend for ionization energy for both the group (column) and the period (row).

decreases down a group
increases $L \rightarrow R$ in a period

24. State the trend for electronegativity for both the group (column) and the period (row).

decreases down a group
increases $L \rightarrow R$ in a period

25. Explain what causes the trend for atomic size down a group (column) and from left to right across a period (horizontal row). (You need to state the if the trend is increasing or decreasing, and then explain why it is this way for each)

Increases down a group b/c adding energy level
decreases $L \rightarrow R$ in a period b/c decreased shielding