

**Test Review – Unit 8 – Molecular Geometry**

1. What are the 10 greek prefixes used when naming covalent compound?
2. What is the phrase or name to help you remember the 7 diatomic molecules? List the 7 diatomic molecules.
3. What is the phrase to help you remember the five transition metals with  $2^+$  and  $3^+$  charge? List these 10 ions.
4. What is the phrase to help you remember the two transition metals with  $2^+$  and  $4^+$  charge? List these 4 ions.
5. What is the phrase to help you remember the two transition metals with  $1^+$  and  $2^+$  charge? List these 4 ions.
6. Which three transition metals have a fixed charge? (List these 3 ions and their charge.)
7. Why does atomic size increase when going down a column on the periodic table?
8. Why does atomic radius decrease when going across a period on a periodic table?
9. Rank by size, largest to smallest, C,  $C^{4+}$  and  $C^{4-}$ .
10. Why does electronegativity increase as you move across a period on a periodic table?
11. Why does electronegativity decrease as you move down a column on a periodic table?

12. Why does ionization energy increase as you move across a period on a periodic table?

13. Why does ionization energy decrease as you move down a column on a periodic table?

14. Explain the difference between an ionic compound and a covalent compound. Give the difference between at least 3 physical properties of each.

15. What does VSEPR stand for? Explain the VSEPR theory. Give an example of a compound where this plays out and determines the shape of the molecule.

16. How are an ionic bond and a covalent bond different?

17. Explain the octet rule. Give an example of a covalent compound and discuss the octet rule in relation to each atom.

18. Give an example of a compound where the central atom exceeds the octet rule. Draw the dot diagram for this molecule.

19. Define a pi bond. Define a sigma bond. Which of these is the weaker bond.

20. Define polarity. Draw the dot diagram for an ionic compound, polar covalent compound and non-polar covalent compound. Indicate whether each is polar or non-polar. Label the dipoles if they exist.

21. Define resonance. Give an example of a compound with a resonance structure and draw the dot diagrams.

22. A certain molecule has a bent shape. Is the molecule  $\text{SO}_2$  or  $\text{SH}_2$ ? Explain in terms of the VSEPR theory and draw the Lewis structures for  $\text{SO}_2$  and  $\text{SH}_2$ .

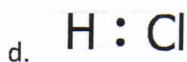
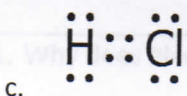
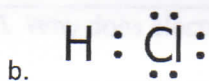
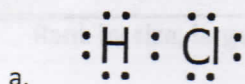
Matching	
Term	Definition
23. Non-polar covalent compound _____	a. A covalent bond in which only one pair of electrons is shared by two bonded atoms.
24. Double covalent bond _____	b. A covalent bond between two atoms of different electronegativity's in which the bonding electrons are not shared equally.
25. Single covalent bond _____	c. A covalent bond formed by the equal sharing of bonding electrons by two atoms.
26. Polar bond _____	d. A covalent bond involving two pairs or electrons; each atom donates one pair of electrons to the bond.
27. Triple covalent bond _____	e. A covalent bond in which three pairs of electrons are shared by the two bonded atoms.

### Multiple Choice

28. A bond in which each atom contributes two electrons is:

- A double covalent bond
- An ionic bond
- A polar covalent bond
- A coordinate covalent bond

29. The electron dot structure for  $\text{HCl}$  is:





30. You would expect a bond formed between a silicon atom and an oxygen atom to be:

- a. An ionic bond
- b. A coordinate covalent bond
- c. A polar covalent bond
- d. A non-polar covalent bond

31. Which one of the following compounds is NOT covalent?

- a.  $\text{SCl}_2$
- b.  $\text{KCl}$
- c.  $\text{HCl}$
- d.  $\text{S}_2\text{Cl}_2$

32. A diatomic molecule with a triple covalent bond is:

- a.  $\text{N}_2$
- b.  $\text{Br}_2$
- c.  $\text{H}_2$
- d.  $\text{O}_2$

33. A molecule of nitrous oxide,  $\text{N}_2\text{O}$  contains all of the following except:

- a. Non-resonance
- b. A triple bond
- c. A double bond
- d. Non-bonding pair of electrons

34. If a bonding pair of electrons is unequally shared between two atoms, the bond is:

- a. ionic
- b. non-polar covalent
- c. coordinate covalent
- d. polar covalent

35. Which of the following compounds is NOT ionic?

- a.  $\text{NaI}$
- b.  $\text{CaCl}_2$
- c.  $\text{CO}_2$
- d.  $\text{Na}_2\text{O}$

36. A covalent bond forms:

- a. When an element becomes a noble gas.
- b. When atoms share electrons.
- c. Between metals and nonmetals.
- d. When electrons are transferred from one atom to another.

37. Which of these compounds would NOT have covalent bonds?

- a.  $\text{NO}_2$
- b.  $\text{K}_2\text{O}$
- c.  $\text{N}_2\text{O}_4$
- d.  $\text{H}_2\text{O}_2$

38. A molecule with a single covalent bond is:

- a.  $\text{CO}_2$
- b.  $\text{F}_2$
- c.  $\text{NO}^{-1}$
- d.  $\text{N}_2$