

5. Molecular compounds achieve the stable electron configuration by _____ing electrons.
- What is the name of this bond type?
 - Draw Lewis diagrams (also called Lewis structures) for: (do 1st on scrap paper)
 - PCl_3
 - CF_3I
 - N_2HF_3
 - $\text{C}_2\text{H}_3\text{Br}$
 - CH_3OH
6. Draw structural formulas (not VSEPR structures) for the compounds in 5b. Do them beside your Lewis diagrams in the space above.
7. Summarize metallic bonding in one short phrase.
8. Complete the following chart:

I or M	Name	Chemical Formula
		N_2S_5
	aluminium carbonate	
		Cu_2CrO_4
	strontium hydroxide	
		KMnO_4
	glucose	

9. Figure 1.19 on page 37 of Inquiry into Chemistry shows that:
- atomic size ↓ as you move from left to right in a given period
 - electronegativity ↑ as you move from left to right in a given period
 - electronegativity ↓ as you move from top to bottom in a given group

Explain each of these trends.

-
-
-

10. Explain how electronegativity accounts for the type of bond, ionic or covalent, that occurs between two different elements. Recall Figure 1.22 on page 40.

11. For each of the following pairs of atoms, predict whether a bond between them will be non-polar covalent, slightly polar covalent, polar covalent, or mostly ionic. **Use the symbols shown in Figure 1.23 on page 41 to indicate polarity if the bond is polar covalent.**

oxygen and hydrogen

sodium and chlorine

carbon and selenium

carbon and hydrogen

12. The shape of an ionic crystal is determined by 2 factors. They are:

-
-

13. Atoms get smaller as you move from left to right across a period on the periodic table. Monatomic ions do the opposite. Explain why.

14. Complete the following chart:

name and/or formula	Lewis Diagram	around central atom		name of shape around each central atom	VSEPR Diagram	Polar or Non-polar
		# LP	# BP			
phosphorus trichloride PCl ₃						
N ₂ HF ₃						
bromoethene C ₂ H ₃ Br						
C ₂ I ₂ Br						

15. Rank, in order of decreasing strength, the following repulsive interactions:

bonding pair/bonding pair, lone pair/lone pair, lone pair/bonding pair

16. Explain why diamond is a hard, brittle solid, while graphite is strong, flexible, and slippery, even though both are composed of pure carbon.

17. Covalent and ionic bonds are each examples of _____ forces.

Intermolecular forces can be divided into 3 types:

-
-
-

18. For each of the intermolecular forces in question 16, state how to determine whether or not it is present and state the main factor determining its relative strength if this is applicable.

-
-
-

19. Predict which of the following pairs of substances will have the higher boiling point. State all bond types involved. Note, these are not all molecular substances.

a) CHF_3 or CH_3F

b) NaCl or C_2F_6

c) V or Li_2O

d) NH_3 or PCl_3

20. Explain, using the metallic bonding model, why metals are malleable.

21. Define or describe the following terms:

electronegativity

network solid

lone pair

tetrahedral shape

polar molecule

ionic crystal lattice

polar covalent bond

orbital

Answers – next page

Answers

1.

isotope symbol	isotope name	atomic number (Z)	mass number (A)	number of protons	number of neutrons
${}_{92}^{235}\text{U}$	uranium-235	92	235	92	143
${}_{51}^{123}\text{Sb}$	antimony-123	51	123	51	72
${}_{49}^{170}\text{In}$	indium-170	49	170	49	121
${}_{72}^{180}\text{Hf}$	hafnium-180	72	180	72	108

2. p. 8

18. p. 63-8\

3. p. 18

19. p. 63-8

4. p. 20-1

20. p. 75

5. p. 9, 23-25

21. throughout – I encourage to look for the answers in your text rather than just looking them up in the glossary

6. p. 31

7. p. 32, 76

8. p. 10-3, 32-4

9. p. 36-8

10. p. 39-40

11. p. 39-40

12. p. 48-9

13. p. 49

14. p. 52-56 (shape), p. 57-9 (polarity)

15. p. 52

16. p.60-1

17. p. 63—8