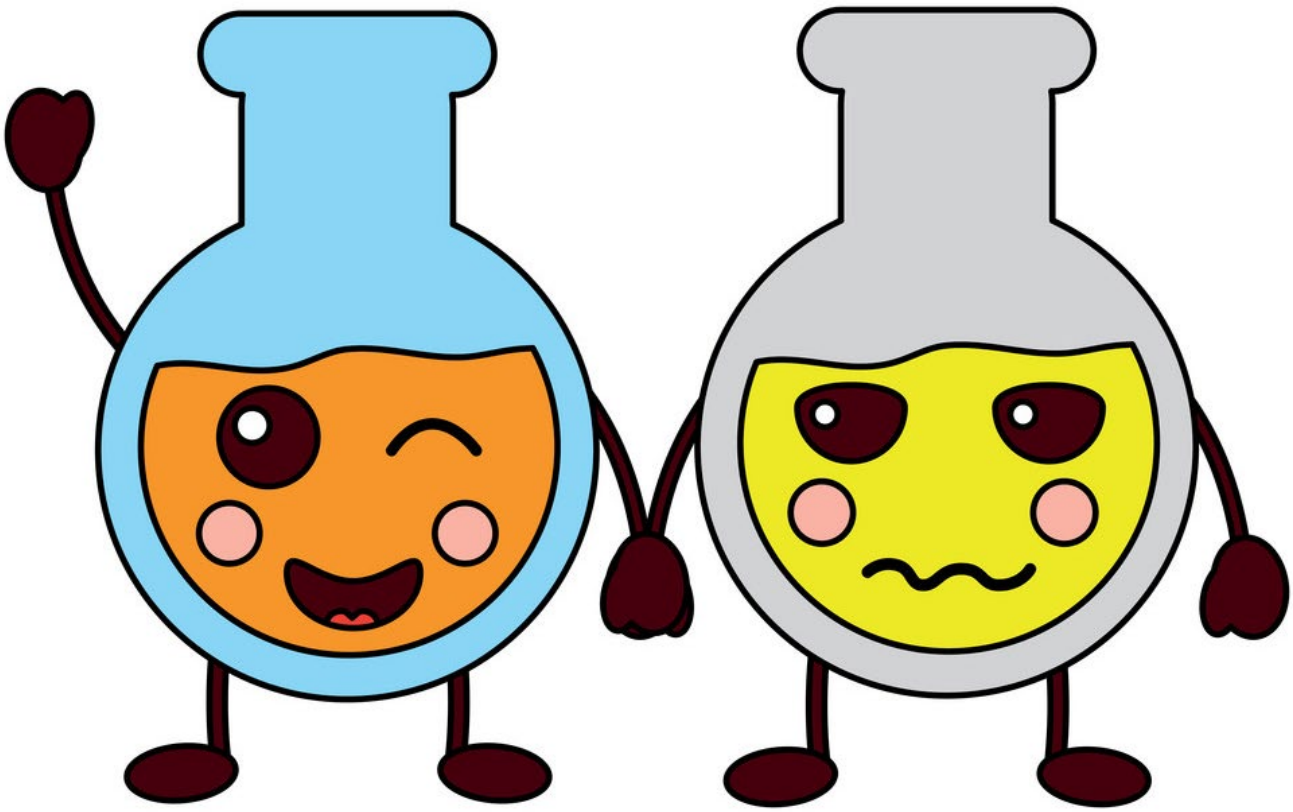
Unit 2: Chemistry (Books 5-7)

"Practice Test"

Science 9



Name: _____ **Date:** _____

Vocabulary: Referring to your notes, define each of the following vocabulary terms in a complete sentence.

1. **atom**	
2. **coefficient**	
3. **compound**	
4. **covalent compound**	
5. **element**	
6. **ion**	
7. **ionic compound**	
8. **molecule**	
9. **polyatomic ions**	
10. **polyvalent metal**	
11. **roman numerals**	
12. **subscript**	
13. **univalent metal**	

The atom and the subatomic particles

1. Use the following vocabulary words to label the diagram.

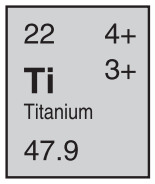
Vocabulary	
common ion charge other ion charge name	symbol atomic number average atomic mass

(a) _____

(b) _____

(c) _____

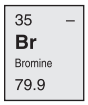
(d) _____



(e) _____

(f) _____

2. Examine the periodic table for the element below and complete the blanks.



(a) atomic number _____ (b) average atomic mass _____

(c) ion charge _____ (d) number of protons _____

(e) name of element _____ (f) number of neutrons _____

3. Complete the following table for the different atoms and ions. The first two rows have been completed to help you.

Element Name	Atomic Number	Ion Charge	Number of Protons	Number of Electrons	Number of Neutrons
potassium	19	1+	19	18	20
phosphorus	15	0	15	15	16
	3	0			
		2+	20		
nitrogen		3–			
	5	0			
argon				18	
	13			10	
chlorine		0			
			11	10	

Bohr diagrams of Ions (+/-)

1. Define the following terms:

(a) Bohr diagram _____

(b) stable octet _____

(c) valence shell _____

(d) valence electrons _____

2. Complete the following table.

Atom/Ion	Atomic Number	Number of Protons	Number of Electrons	Number of Neutrons	Number of Electron Shells
neon atom					
fluorine atom					
fluorine ion					
sodium atom					
sodium ion					

3. Use the table above to draw the Bohr model diagram for each of the following atoms and ions.

potassium ion	oxide ion	aluminium ion	chloride ion	beryllium ion

4. Draw the Bohr model diagram for each of the following compounds.

carbon dioxide (CO_2)	ammonia (NH_3)	calcium chloride ($CaCl_2$)

Names and formulas of compounds

Match each Chemical Name on the left with the correct Chemical Formula on the right.	
Chemical Name	**Chemical Formula**
1. _____ tin(II) chlorate **2.** _____ sulphur dichloride **3.** _____ strontium perchlorate	**A.** SCl **B.** S_2Cl **C.** SCl_2 **D.** SnClO **E.** $Sn(ClO_2)_2$ **F.** $Sn(ClO_3)_2$ **G.** $Sn(ClO_4)_2$ **H.** $Sr(ClO_3)_2$ **I.** $Sr(ClO_4)_2$

4. Which of the following is a **covalent compound?**

A. SrO **C.** SnO_2

B. SeO_2 **D.** Sc_2O_3

5. In which of the following do **covalent bonds** hold the atoms together?

A. silver

B. calcium carbonate

C. silicon tetrafluoride

D. magnesium bromide

6. What is the total number of atoms that make up iodine ***penta***chloride?

A. 2 **C.** 5

B. 4 **D.** 6

7. Which of the following occurs when carbon forms a compound with oxygen?

A. oxygen and carbon share electrons

B. both oxygen and carbon lose electrons

C. oxygen gains electrons, while carbon loses electrons

D. carbon gains electrons, while oxygen loses electrons

8. In the chemical reaction $CuO + CO_2 \rightarrow CuCO_3$, which of the following are ***ionic compounds?***

I.	CO_2
II.	CuO
III.	$CuCO_3$

A. I and II only **C.** II and III only

B. I and III only **D.** I, II, and III

9. Which of the following is the formula for the **compound** formed by ammonium and dichromate?

A. $NH_4Cr_2O_7$

B. $(NH_4)_2CrO_4$

C. $NH_4(Cr_2O_7)_2$

D. $(NH_4)_2Cr_2O_7$

10. In which of the following compounds does manganese have the highest ion charge?

A. MnO_3 **C.** $MnSO_3$

B. $MnBr_2$ **D.** $Mn(OH)_4$

11. In which of the following compounds is the ion charge on copper **the same**?

I.	Cu_2O
II.	$CuCl_2$
III.	$CuCO_3$

A. I and II only **C.** II and III only

B. I and III only **D.** I, II, and III

12. In the name arsenic(III) chloride, what does the Roman numeral reveal about arsenic?

A. it has an ion charge of 3–

B. it has an ion charge of 3+

C. it has gained three electrons

D. it can form three positive ions

Chemical names and formulas of covalent compounds

1. What is a covalent compound?

_____

2. What type of bond is formed in a covalent compound?

_____

3. What is used in naming covalent compounds?

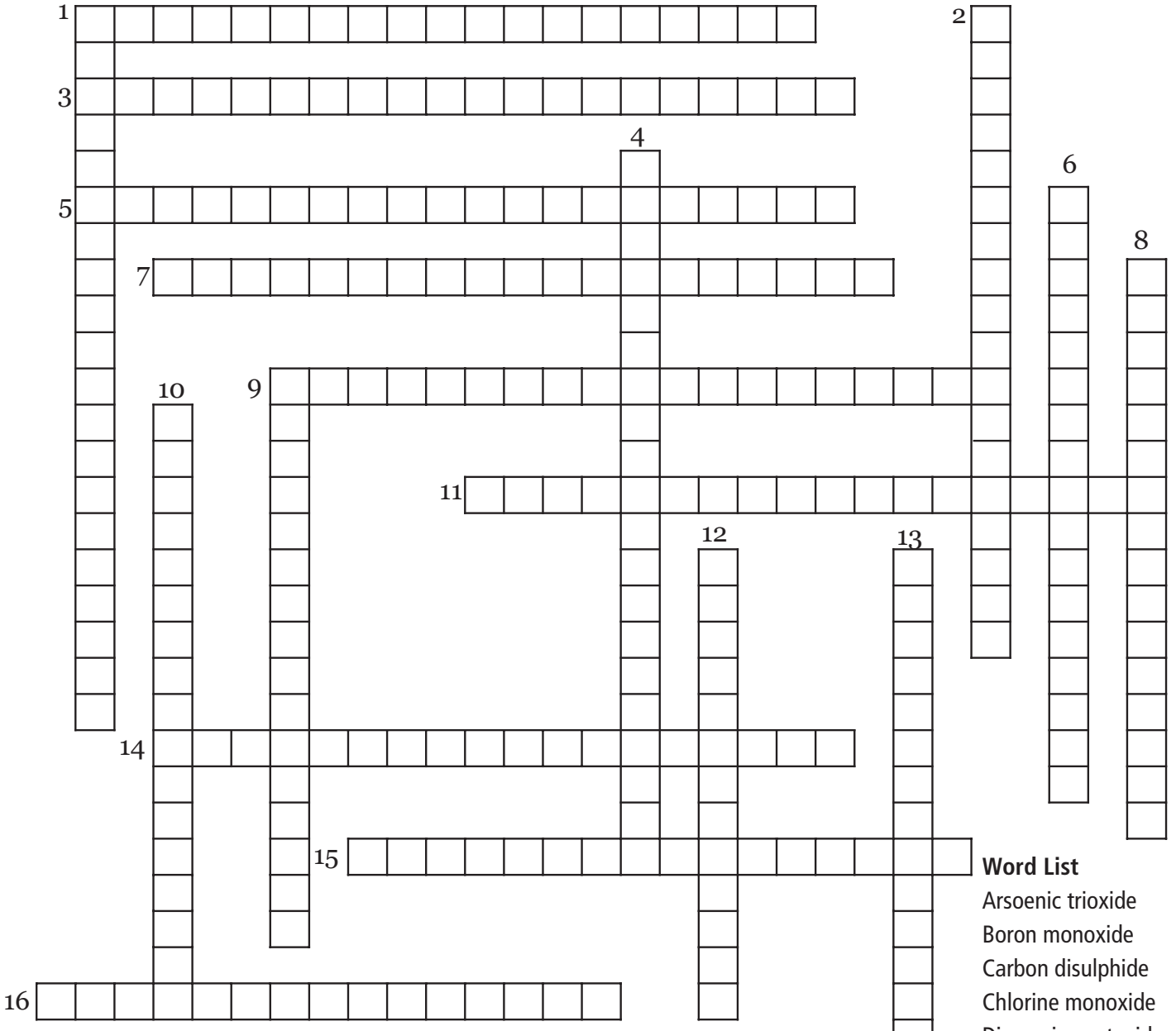
_____

4. Write the chemical formula for each of the following compounds.

(a) silicon dioxide _____	(i) dinitrogen pentoxide _____
(b) chlorine dioxide _____	(j) dinitrogen monoxide _____
(c) tellurium dioxide _____	(k) arsenic tetrabromide _____
(d) selenium trioxide _____	(l) arsenic pentachloride _____
(e) carbon disulphide _____	(m) disulphide pentoxide _____
(f) arsenic trichloride _____	(n) sulphur monochloride _____
(g) chlorine heptoxide _____	(o) phosphorus trichloride _____
(h) selenium difluoride _____	(p) diphosphorus pentoxide _____

COVALENT COMPOUNDS CROSSWORD PUZZLE

5. Complete the following crossword puzzle.
Given the chemical formula, **what is the name for the covalent compound?**



ACROSS

1. S_2Cl_2
3. PBr_3
5. SiF_4
7. Cl_2O_7
9. ClF_3
11. N_2O_3
14. $TeBr_2$
15. ClO
16. AsO_3

DOWN

1. P_2O_3
2. As_2O_5
4. SCl_4
6. ICl_3
8. NO
9. CS_2
10. TeO_3
12. BO
13. NO_2

Word List

Arsoenic trioxide
Boron monoxide
Carbon disulphide
Chlorine monoxide
Diarsenic pentoxide
Dichlorine heptoxide
Dinitrogen trioxide
Disulphur dichloride
Iodine trichloride
Nitrogen dioxide
Nitrogen monoxide
Phosphorus tribromide Silicon tetrafluoride Sulphur tetrachloride
Tellurium dibromide
Tellurium trioxide

Knowledge: Answer each of the following questions. Make sure to use complete sentences, where applicable. It should be clear from your answer what the question was!

1. **Count the total number of atoms in the following compounds.**

    1. NaOH _____

    2. 4 HNO_3 _____

    3. $MgCl_2$ _____

    4. 4 Li_2O _____

    5. 2 NaOH _____

    6. Li_2SO_4 _____

    7. 3 H_2O _____

    8. $NaC_2H_3O_2$ _____

    9. 3 Al_2O_3 _____

    10. NH_4Cl _____

    11. 5 $ZnSO_4$ _____

    12. 7 C_2S_2 _____

    13. 2 $Sr_3(PO_4)_2$ _____

    14. 4 $Al(OH)_3$ _____

    15. Ca $(C_2H_3O_2)_2$ _____

    16. 4 $Al_2(SO_3)_3$ _____

    17. 2 $(NH_4)_3PO_4$ _____

    18. 4 $Mg(OH)_2$ _____

2. **Draw the Bohr diagram for the ionic compound aluminum nitride.**

3. **Distinguish between an element and a compound.**

4. **Distinguish between a compound and a molecule.**

5. **For each of the following pairs of substances, identify whether the compound they form will be ionic or covalent:**

    1. **potassium and sulphur** _____
    2. **lithium and chlorine** _____
    3. **oxygen and fluorine** _____
    4. **sulphur and bromine** _____
    5. **copper and perchlorate** _____

6. **For each of the following compounds, identify whether they are ionic or covalent:**

    1. **AlP** _____
    2. **CO_2** _____
    3. **$FeCO_3$** _____
    4. **$Fe2O_3$** _____
    5. **$CrCl_3$** _____
    6. **Na_3PO_4** _____
    7. **SO_3** _____
    8. **NO** _____

7. Write the chemical names of each of the following compounds.

1. **CaS** _____
2. **Cs_2O** _____
3. **$FeCO_3$** _____
4. **$CrCl_2$** _____
5. **$Mg_3(PO_4)_2$** _____
6. **Au_2O_3** _____
7. **CaS** _____
8. **$(NH_4)_3PO_3$** _____
9. **$FeCl_2$** _____
10. **KCl** _____
11. **Na_2S** _____
12. **$AlCl_3$** _____
13. **BaO** _____
14. **Ag_2S** _____
15. **Al_2O_3** _____
16. **LiF** _____
17. **ZnF_2** _____
18. **$MgBr_2$** _____
19. **CaS** _____
20. **Li_2O** _____
21. **ZnI_2** _____
22. **$BaBr_2$** _____
23. **MgS** _____
24. **$AgCl$** _____
25. **FeO** _____
26. **SnS_2** _____

27. Cr_2S_3 _____

28. SnF_2 _____

29. $CuCl$ _____

30. MnO_2 _____

31. $HgBr$ _____

32. $CrCl_3$ _____

33. PbS _____

34. CuF_2 _____

35. NiS _____

36. $PbCl_4$ _____

37. CrO _____

38. Hg_3N_2 _____

39. Sn_3P_4 _____

8. Write the chemical formulas of each of the following compounds.

1. **zinc oxide** _____
2. **aluminum fluoride** _____
3. **potassium bromide** _____
4. **calcium oxide** _____
5. **iron (II) fluoride** _____
6. **tin (IV) oxide** _____
7. **sodium sulphate** _____
8. **strontium hydroxide** _____
9. **nickel (III) chlorate** _____
10. **iron (III) sulphite** _____
11. **zinc bromide** _____
12. **calcium fluoride** _____

13. **silver sulfide** _____

14. **lithium sulfide** _____

15. **potassium sulfide** _____

16. **magnesium oxide** _____

17. **magnesium phosphide** _____

18. **sodium nitride** _____

19. **silver fluoride** _____

20. **barium nitride** _____

21. **copper (II) chloride** _____

22. **iron (III) oxide** _____

23. **manganese (II) nitride** _____

24. **lead (IV) bromide** _____

25. **tin (IV) sulfide** _____

26. **manganese (IV) phosphide** _____

27. **iron (II) oxide** _____

28. **lead (IV) sulfide** _____

29. **mercury (II) sulfide** _____

30. **copper (II) nitride** _____

9. **The compound H_2O_2 is separated and produces hydrogen gas and oxygen gas as a result. What do you expect will be the ratio of the two gases produced?**

_____

_____

10. **Water is separated and produces hydrogen gas and oxygen gas as a result. What do you expect will be the ratio of the two gases produced?**

_____

_____

11. **Determine the ratio of atoms of each element in the compound ammonium monohydrogen phosphate: $(NH_4)_2HPO_4$**

_____

_____

12. **Explain the importance of the Roman numerals in the names of the three compounds: manganese (IV) nitride, manganese (III) nitride and manganese (II) nitride. In your answer include the total number of atoms in each compound.**

_____

_____

_____

_____

13. **Knowing that barium and oxygen react in a one to one ratio, in what ratio will radium and oxygen react? In your answer include to concepts of chemical families and valence electrons.**

_____

_____

_____

_____

_____