

# Science 10 Chemistry Practice Booklet

## Lesson 1: Properties and Classification of Matter/History of Chemistry

1. Pg. 17 # 1, 3, 4, 6. Pg. 25 # 10, 11. Read: Pg. 6-26.

## Lesson 2: The Periodic Table and Atomic Structure

Element Name	Symbol	Period	Group	Metal or Non Metal
chromium	Cr	4	6	Metal
bromine	Br	4	17	Non-metal
phosphorus	P	3	15	Non-metal
helium	He	1	18	Non-metal
bohrium	Bh	7	7	Metal
bismuth	Bi	6	15	Metal
carbon	C	2	14	Non metal
tin	Sn	5	14	Metal
chlorine	Cl	3	17	Non-metal
niobium	Nb	5	5	Metal

1. The elements in the periodic table are arranged in metals and non-metals. The elements are put into these two categories based on their physical properties. The columns are called groups and the rows are called periods.

2. How many groups exist on the periodic table?

18

3. How many periods exist on the periodic table?

7

4. What is the first element in group 16?

Oxygen ( $O_2$ )

5. What is the first element in period 4?

potassium (K)

6. According to the periodic table in your databook what does each square contain

- atomic #
- name of element
- atomic mass
- symbol
- ion charge
- IUPAC stock name

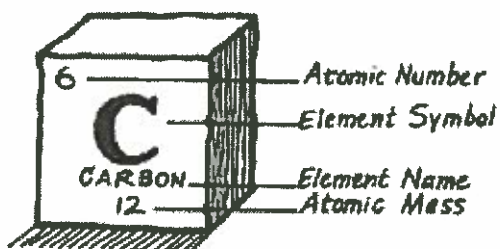
11. What on the periodic table separates the metals from the non-metals?

staircase

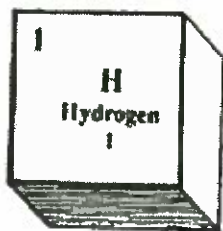
11. Metals are found on the left side of the table.

12. Non-metals are found on the right side of the table.

13. Fill in the following missing information:



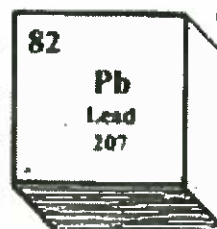
**REMEMBER:**  
atomic mass = protons + neutrons  
atomic number = # protons  
# protons = # electrons



1. a. atomic number  
1  
b. atomic mass  
1.01



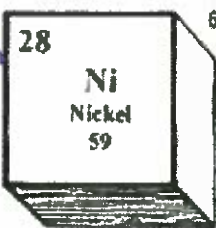
5. a. # electrons  
79  
b. # protons  
79  
c. atomic number  
79  
d. name of element  
gold



9. a. element name  
lead  
b. # protons  
82



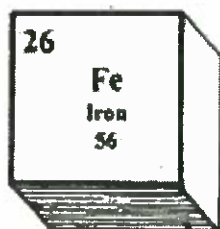
2. a. element name  
magnesium  
b. atomic number  
12



6. a. atomic mass  
58.69  
b. element symbol  
Ni



10. a. # electrons  
40  
b. atomic mass  
91.22



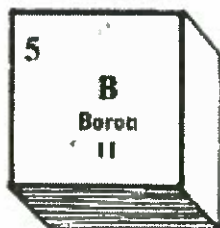
3. a. # protons  
26  
b. element symbol  
Fe



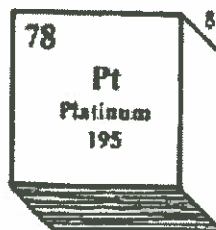
7. a. element symbol  
Na  
b. # neutrons  
12  
c. element name  
sodium



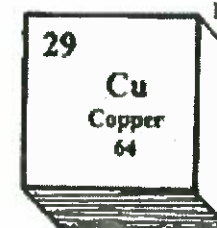
11. a. atomic number  
88  
b. # neutrons  
138



4. a. atomic number  
5  
b. element name  
boron



8. a. atomic number  
78  
b. # neutrons  
117



12. a. atomic mass  
63.55  
b. # neutrons  
35

### Lesson 3: Atomic Theory

Pg. 39 # 1-7.

### Lesson 4: Ionic Compounds

Give the formula for each of the following:

1. <sup>+</sup>potassium <sup>-</sup>chloride KCl(s)
2. <sup>+</sup>cesium <sup>3-</sup>phosphide Cs<sub>3</sub>P(s)
3. <sup>3+</sup>gadolinium <sup>2-</sup>oxide Gd<sub>2</sub>O<sub>3</sub>(s)
4. <sup>2+</sup>calcium <sup>3-</sup>nitride Ca<sub>3</sub>N<sub>2</sub>(s)
5. <sup>3+</sup>aluminum <sup>-</sup>fluoride AlF<sub>3</sub>(s)
6. <sup>+</sup>sodium <sup>2-</sup>sulfide Na<sub>2</sub>S(s)
7. <sup>3+</sup>erbium <sup>3-</sup>arsenide ErAs(s)
8. <sup>2+</sup>magnesium <sup>2-</sup>selenide MgSe(s)
9. <sup>2+</sup>zinc <sup>-</sup>astatide ZnAt<sub>2</sub>(s)
10. <sup>+</sup>lithium <sup>-</sup>hydride LiH(s)
11. <sup>2+</sup>barium <sup>-</sup>bromide BaBr<sub>2</sub>(s)
12. <sup>3+</sup>terbium <sup>-</sup>chloride TbCl<sub>3</sub>(s)
13. <sup>+</sup>francium <sup>2-</sup>oxide Fr<sub>2</sub>O(s)
14. <sup>3+</sup>lanthanum <sup>3-</sup>phosphide LaP(s)
15. <sup>+</sup>hydrogen <sup>3-</sup>nitride H<sub>3</sub>N(s)
16. <sup>4+</sup>thorium <sup>2-</sup>oxide ThO<sub>2</sub>(s)
17. <sup>3+</sup>scandium <sup>-</sup>fluoride ScF<sub>3</sub>(s)
18. <sup>2+</sup>strontium <sup>2-</sup>sulfide SrS(s)
19. <sup>2+</sup>beryllium <sup>2-</sup>oxide BeO(s)

20. <sup>3+</sup> californium <sup>-</sup> hydride CfH<sub>3</sub>(s)
21. <sup>3+</sup> actinium <sup>3-</sup> phosphide AcP<sub>3</sub>(s)
22. <sup>3+</sup> yttrium <sup>-</sup> hydride YH<sub>3</sub>(s)
23. <sup>3+</sup> fermium <sup>-</sup> astatide FmAt<sub>3</sub>(s)
24. <sup>5+</sup> neptunium <sup>-</sup> chloride NpCl<sub>5</sub>(s)

Given the formula, supply the correct name.

1. Ag<sub>2</sub>O Silver oxide
2. RbCl rubidium chloride
3. KF potassium fluoride
4. Ca<sub>3</sub>N<sub>2</sub> calcium nitride
5. DyP dysprosium phosphide
6. MgO magnesium oxide
7. Na<sub>2</sub>S sodium sulfide
8. Nd<sub>2</sub>Se<sub>3</sub> neodymium selenide
9. CsI cesium iodide
10. BaBr<sub>2</sub> barium bromide
11. Al<sub>2</sub>O<sub>3</sub> aluminium oxide
12. ZnF<sub>2</sub> zinc fluoride
13. HoCl<sub>3</sub> holmium chloride
14. LiH lithium hydride
15. H<sub>2</sub>S hydrogen sulfide

- |     |                         |                           |
|-----|-------------------------|---------------------------|
| 16. | $\text{SrAt}_2$         | <u>strontium astatide</u> |
| 17. | $\text{YI}_3$           | <u>yttrium iodide</u>     |
| 18. | $\text{Pm}_2\text{O}_3$ | <u>promethium oxide</u>   |
| 19. | $\text{CmF}_3$          | <u>curium fluoride</u>    |
| 20. | $\text{Na}_3\text{P}$   | <u>sodium phosphide</u>   |
| 21. | $\text{ScO}$            | <u>scandium oxide</u>     |
| 22. | $\text{Fr}_3\text{N}$   | <u>francium nitride</u>   |
| 23. | $\text{Cs}_2\text{O}$   | <u>cesium oxide</u>       |
| 24. | $\text{KCl}$            | <u>potassium chloride</u> |
| 25. | $\text{AlBr}_3$         | <u>aluminium bromide</u>  |

**Lesson 5: Multi-Charge Ionic Compounds**

Use your data book. Remember that spelling mistakes are ERRORS.

A. Name each of the following:

- |                            |                               |                         |                                |
|----------------------------|-------------------------------|-------------------------|--------------------------------|
| 1. $\text{HgF}$            | <u>mercury (I) fluoride</u>   | $\text{NiO}$            | <u>nickel (II) oxide</u>       |
| 2. $\text{FeCl}_3$         | <u>iron (III) chloride</u>    | $\text{Bi}_2\text{O}_5$ | <u>bismuth (V) oxide</u>       |
| 3. $\text{VCl}_4$          | <u>vanadium (IV) chloride</u> | $\text{PbS}_2$          | <u>lead (IV) sulfide</u>       |
| 4. $\text{Cu}_2\text{O}$   | <u>copper (I) oxide</u>       | $\text{Sn}_3\text{P}_4$ | <u>tin (IV) phosphide</u>      |
| 5. $\text{CrN}$            | <u>chromium (III) nitride</u> | $\text{Tl}_3\text{As}$  | <u>thallium (I) arsenide</u>   |
| 6. $\text{PtO}_2$          | <u>platinum (IV) oxide</u>    | $\text{SmF}_3$          | <u>samarium (III) fluoride</u> |
| 7. $\text{Am}_2\text{O}_3$ | <u>americium (III) oxide</u>  | $\text{PbO}$            | <u>lead (II) oxide</u>         |
| 8. $\text{PoF}_4$          | <u>polonium (IV) fluoride</u> | $\text{Bk}_2\text{O}_3$ | <u>berkelium (III) oxide</u>   |



9.  $\text{FeI}_3$  iron(III) iodide       $\text{Au}_3\text{P}$  gold(I) phosphide
10.  $\text{SmH}_3$  samarium(III) hydride       $\text{PaCl}_5$  protactinium(V) chloride
11.  $\text{PuS}_2$  plutonium(IV) sulfide       $\text{CuH}$  copper(I) hydride
12.  $\text{Ni}_2\text{S}_3$  nickel(III) sulfide       $\text{PdSe}$  palladium(II) selenide
13.  $\text{NoN}$  nobelium(III) nitride       $\text{BiP}$  bismuth(III) phosphide
14.  $\text{CoBr}_3$  cobalt(III) bromide       $\text{Ni}_2\text{Te}_3$  nickel(III) telluride
15.  $\text{PoS}$  polonium(II) sulfide       $\text{AmH}_4$  americium(IV) hydride

B. Give the formula for each.

16. iron(III) telluride  $\overset{3+}{\text{Fe}}_2\overset{2-}{\text{Te}}_3$       copper(II) phosphide  $\overset{2+}{\text{Cu}}_3\overset{3-}{\text{P}}_2$
17. manganese(IV) oxide  $\overset{4+}{\text{Mn}}\overset{2-}{\text{O}}_2$       bismuth(V) fluoride  $\overset{5+}{\text{Bi}}\overset{-}{\text{F}}_5$
18. samarium(III) chloride  $\overset{3+}{\text{Sm}}\overset{-}{\text{Cl}}_3$       tin(II) fluoride  $\overset{2+}{\text{Sn}}\overset{-}{\text{F}}_2$
19. gold(I) sulfide  $\overset{+}{\text{Au}}_2\overset{2-}{\text{S}}$       berkelium(IV) selenide  $\overset{4+}{\text{Bk}}\overset{2-}{\text{Se}}_2$
20. cobalt(II) sulfide  $\overset{2+}{\text{Co}}\overset{2-}{\text{S}}$       manganese(II) iodide  $\overset{2+}{\text{Mn}}\overset{-}{\text{I}}_2$
21. gold(III) arsenide  $\overset{3+}{\text{Au}}\overset{3-}{\text{As}}$       uranium(VI) oxide  $\overset{6+}{\text{U}}\overset{2-}{\text{O}}_3$
22. tin(IV) bromide  $\overset{4+}{\text{Sn}}\overset{-}{\text{Br}}_4$       plutonium(VI) phosphide  $\overset{6+}{\text{Pu}}\overset{3-}{\text{P}}_2$
23. vanadium(IV) hydride  $\overset{4+}{\text{V}}\overset{-}{\text{H}}_4$       iron(II) nitride  $\overset{2+}{\text{Fe}}_3\overset{3-}{\text{N}}_2$
24. mercury(II) fluoride  $\overset{2+}{\text{Hg}}\overset{-}{\text{F}}_2$       ruthenium(III) oxide  $\overset{3+}{\text{Ru}}_2\overset{2-}{\text{O}}_3$

25.  $4+$   $3-$  platinum (IV) phosphide  $Pt_3P_4$

$3+$   $2-$  cobalt (III) telluride  $Co_2Te_3$

26.  $3+$   $2-$  antimony (III) sulfide  $Sb_2S_3$

$5+$   $3-$  niobium (V) nitride  $Nb_3N_5$

27.  $3+$   $2-$  titanium (III) sulfide  $Ti_2S_3$

$+$   $-$  gold (I) hydride  $AuH$

28.  $4+$   $3-$  titanium (IV) phosphide  $Ti_3P_4$

$5+$   $-$  bismuth (V) chloride  $BiCl_5$

29.  $3+$   $3-$  niobium (III) arsenide  $NbAs$

$2+$   $-$  tin (II) chloride  $SnCl_2$

30.  $4+$   $2-$  manganese (IV) sulfide  $MnS_2$

$3+$   $2-$  cobalt (III) oxide  $Co_2O_3$

### Lesson 6: Polyatomic Ionic Compounds

Use your data book. Remember that spelling mistakes and missing brackets are ERRORS.

A. Name each of the following:

1. NaCl sodium chloride

$Ba(NO_3)_2$

barium nitrate

2.  $SnF_2$  tin(II) fluoride

$Al(OH)_3$

aluminium hydroxide

3.  $Fe(NO_3)_3$  iron(III) nitrate

$SrO$

strontium oxide

4.  $CuSO_4$  copper(II) sulfate

$SnS_2$

tin(IV) sulfide

5.  $MgSO_4$  magnesium sulfate

$AgHSO_3$

silver hydrogen sulfite

6.  $CuMnO_4$  copper(I) permanganate

$AlPO_4$

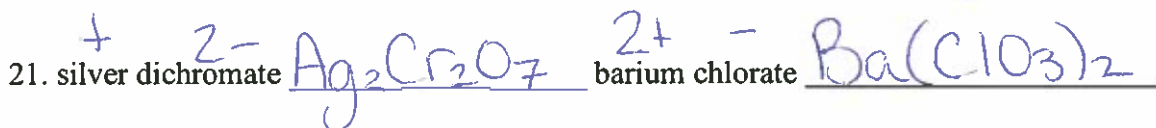
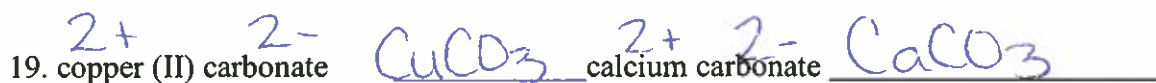
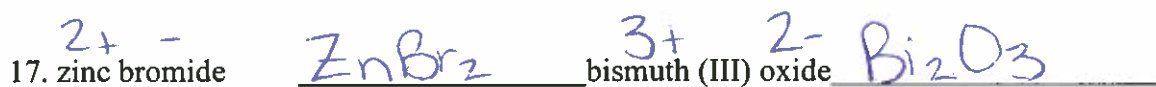
aluminium phosphate



7.  $\text{AuNO}_3$  gold (I) nitrate  $\text{PtO}$  platinum (II) oxide
8.  $\text{BiCl}_3$  bismuth (III) chloride  $\text{MnO}_2$  manganese (IV) oxide
9.  $\text{Fe}(\text{ClO})_3$  iron (III) hypochlorite  $\text{ZnO}$  zinc oxide
10.  $\text{Nb}(\text{CN})_5$  niobium (V) cyanide  $\text{OsBr}_4$  osmium bromide
11.  $\text{Pb}(\text{NO}_3)_2$  lead (II) nitrate  $\text{CuHSO}_3$  copper (I) hydrogen sulfite
12.  $\text{NiO}$  nickel (II) oxide  $\text{Pd}(\text{NO}_2)_2$  palladium (II) nitrite
13.  $\text{CsF}$  cesium fluoride  $\text{Al}(\text{OH})_3$  aluminium hydroxide
14.  $\text{Cr}(\text{MnO}_4)_2$  chromium (II) permanganate  $\text{NiPO}_4$  nickel (III) phosphate
15.  $\text{Fe}(\text{CN})_2$  iron (II) cyanide  $\text{Ir}(\text{C}_6\text{H}_5\text{COO})_4$  iridium benzoate
16.  $\text{NaCH}_3\text{COO}$  sodium acetate  $\text{Al}_2(\text{SO}_4)_3$  aluminium sulfate
17.  $(\text{NH}_4)_2\text{SO}_3$  ammonium sulfite  $\text{Ni}(\text{HCO}_3)_3$  nickel (III) hydrogen carbonate
18.  $\text{Mn}(\text{CO}_3)_2$  manganese (IV) carbonate  $\text{LiClO}_3$  lithium chlorate
19.  $\text{Pb}(\text{CN})_4$  lead (IV) cyanide  $(\text{NH}_4)_3\text{PO}_4$  ammonium phosphate
20.  $\text{Fe}(\text{ClO})_3$  iron (III) hypochlorite  $\text{NaH}_2\text{PO}_4$  sodium dihydrogen phosphate
21.  $\text{KMnO}_4$  potassium permanganate  $\text{Cu}_3(\text{PO}_4)_2$  copper (II) phosphate
22.  $\text{RbClO}$  rubidium hypochlorite  $\text{Al}(\text{CN})_3$  aluminium cyanide

23.  $(\text{NH}_4)_2\text{HPO}_4$  Ammonium hydrogen phosphate  $\text{Al}(\text{NO}_3)_3$  aluminium nitrate
24.  $\text{CuCrO}_4$  copper(II) chromate  $\text{MgCrO}_4$  magnesium chromate
25.  $\text{KHS}$  potassium hydrogen sulfide  $\text{AgOH}$  silver hydroxide
26.  $\text{Au}_2\text{HPO}_4$  gold(III) hydrogen phosphate  $\text{SnSiO}_3$  tin(II) silicate
27.  $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$  ammonium dichromate  $\text{AgNO}_2$  silver nitrite
28.  $\text{Ba}(\text{OH})_2$  barium hydroxide  $\text{HgOH}$  mercury(I) hydroxide
29.  $\text{Cr}(\text{CN})_3$  chromium(III) cyanide  $\text{TlPO}_4$  thallium(III) phosphate
30.  $\text{Zn}(\text{ClO})_2$  Zinc hypochlorite  $\text{Pb}(\text{C}_6\text{H}_5\text{COO})_2$  lead(II) benzoate

Give the formula for each.



22. ruthenium (III) sulfide  $\overset{3+}{Ru}_2\overset{2-}{S}_3$  strontium bromide  $\overset{2+}{Sr}\overset{-}{Br}_2$

23. calcium hydroxide  $\overset{2+}{Ca}(\overset{-}{OH})_2$  iron (III) nitrate  $\overset{3+}{Fe}(\overset{-}{NO}_3)_3$

24. mercury (II) fluoride  $\overset{2+}{Hg}\overset{-}{F}_2$  indium oxide  $\overset{3+}{In}_2\overset{2-}{O}_3$

25. platinum (IV) chloride  $\overset{4+}{Pt}\overset{-}{Cl}_4$  rhenium chloride  $\overset{7+}{Re}\overset{-}{Cl}_7$

26. polonium (II) sulfite  $\overset{2+}{Po}\overset{2-}{SO}_3$  platinum (IV) thiosulfate  $\overset{4+}{Pt}(\overset{2-}{S}_2O_3)_2$

27. titanium (III) sulfate  $\overset{3+}{Ti}_2(\overset{2-}{SO}_4)_3$  silver hydroxide  $\overset{+}{Ag}\overset{-}{OH}$

28. zinc phosphate  $\overset{2+}{Zn}_3(\overset{3-}{PO}_4)_2$  cadmium borate  $\overset{2+}{Cd}_3(\overset{3-}{BO}_3)_2$

29. gallium hydroxide  $\overset{3+}{Ga}(\overset{-}{OH})_3$  tin (II) acetate  $\overset{2+}{Sn}(\overset{-}{CH}_3COO)_2$

30. potassium chromate  $\overset{+}{K}_2(\overset{2-}{CrO}_4)$  cobalt (III) hydride  $\overset{3+}{Co}\overset{-}{H}_3$

31. aluminium sulfite  $\overset{3+}{Al}_2(\overset{2-}{SO}_3)_3$  tin (II) acetate  $\overset{2+}{Sn}(\overset{-}{CH}_3COO)_2$

32. zinc hydrogen sulfide  $\overset{2+}{Zn}(\overset{-}{HS})_2$  silver dichromate  $\overset{+}{Ag}_2\overset{2-}{Cr}_2O_7$

33. aluminium borate  $\overset{3+}{Al}\overset{3-}{BO}_3$  sodium benzoate  $\overset{+}{Na}\overset{-}{C}_6H_5COO$

34. copper (II) carbonate  $\overset{2+}{Cu}\overset{2-}{CO}_3$  cobalt (III) nitrate  $\overset{3+}{Co}(\overset{-}{NO}_3)_3$

35. ammonium dichromate  $\overset{+}{(NH}_4)_2\overset{2-}{Cr}_2O_7$  manganese (IV) nitrate  $\overset{4+}{Mn}(\overset{-}{NO}_3)_4$

36. cesium hydroxide  $\overset{+}{Cs}\overset{-}{OH}$  strontium cyanide  $\overset{2+}{Sr}(\overset{-}{CN})_2$

37. lead (II) carbonate  $\overset{2+}{Pb}\overset{2-}{CO}_3$  germanium hypochlorite  $\overset{4+}{Ge}(\overset{-}{ClO})_4$

38. calcium hydrogencarbonate  $\overset{2+}{\text{Ca}}(\overset{-}{\text{HCO}_3})_2$  iron (III) chromate  $\overset{3+}{\text{Fe}}_2(\overset{2-}{\text{CrO}_4})_3$

39. ammonium cyanide  $\overset{+}{\text{NH}_4}\overset{-}{\text{CN}}$  vanadium (V) permanganate  $\overset{5+}{\text{V}}(\overset{-}{\text{MnO}_4})_5$

40. gold (III) nitrite  $\overset{3+}{\text{Au}}(\overset{-}{\text{NO}_2})_3$  platinum (IV) carbonate  $\overset{4+}{\text{Pt}}(\overset{2-}{\text{CO}_3})_2$

41. beryllium silicate  $\overset{2+}{\text{Be}}\overset{2-}{\text{SiO}_3}$  potassium hypochlorite  $\overset{+}{\text{K}}\overset{-}{\text{ClO}}$

42. aluminium hydrogensulfate  $\overset{3+}{\text{Al}}(\overset{-}{\text{HSO}_4})_3$  actinium nitrate  $\overset{3+}{\text{Ac}}(\overset{-}{\text{NO}_3})_3$

43. iron (II) phosphate  $\overset{2+}{\text{Fe}}_3(\overset{3-}{\text{PO}_4})_2$  platinum (II) borate  $\overset{2+}{\text{Pt}}_3(\overset{3-}{\text{BO}_3})_2$

44. gold (I) hydroxide  $\overset{+}{\text{Au}}\overset{-}{\text{OH}}$  indium phosphate  $\overset{3+}{\text{In}}\overset{3-}{\text{PO}_4}$

45. zirconium nitrite  $\overset{4+}{\text{Zr}}(\overset{-}{\text{NO}_2})_4$  magnesium silicate  $\overset{2+}{\text{Mg}}\overset{2-}{\text{SiO}_3}$

### Lesson 7: Molecular Compounds

Provide the name or the formula for each.

1. SiC silicon monocrbide  $\text{PI}_3$  phosphorus triiodide

2.  $\text{TeBr}_2$  tellurium dibromide  $\text{NCl}_3$  nitrogen trichloride

3.  $\text{P}_4\text{S}_6$  tetraphosphorus hexosulfide  $\text{Si}_3\text{P}_4$  trisilicon tetraphosphide

4.  $\text{N}_2\text{O}$  dinitrogen monoxide  $\text{TeBr}_4$  tellurium tetrabromide

5.  $\text{SiH}_4$  Silicon tetrahydride  $\text{SO}_2$  Sulfur dioxide

6.  $\text{NO}_2$  nitrogen dioxide  $\text{S}_2\text{Br}_2$  disulfur dibromide

7.  $\text{SiF}_4$  Silicon tetrafluoride  $\text{N}_2\text{O}_3$  dinitrogen trioxide

8.  $\text{P}_2\text{O}_3$  diphosphorus trioxide  $\text{ClO}_3$  chlorine trioxide

9.  $\text{KrF}_2$  Krypton difluoride  $\text{NO}$  nitrogen monoxide

10.  $\text{CO}$  Carbon monoxide  $\text{CH}_4$  Carbon tetrahydride

11. nitrogen trifluoride  $\text{NF}_3$  diarsenic pentasulfide  $\text{As}_2\text{S}_5$

12. tetraboron monocarbide  $\text{B}_4\text{C}$  silicon tetrabromide  $\text{SiBr}_4$

13. diphosphorous trichloride  $\text{P}_2\text{Cl}_3$  tellurium tetraoxide  $\text{TeO}_4$

14. dicarbon hexahydride  $\text{C}_2\text{H}_6$  hydrogen dioxide  $\text{HO}_2$

15. carbon monoxide  $\text{CO}$  hexacarbon hexahydride  $\text{C}_6\text{H}_6$

16. sulfur trioxide  $\text{SO}_3$  dinitrogen tetraoxide  $\text{N}_2\text{O}_4$

17. diarsenic trisulfide As<sub>2</sub>S<sub>3</sub> sulfur monochloride SCl

18. selenium difluoride SeF<sub>2</sub> boron tribromide BBr<sub>3</sub>

19. tellurium tetraiodide TeI<sub>4</sub> phosphorous dioxide PO<sub>2</sub>

20. trisulfur tetrabromide S<sub>3</sub>Br<sub>4</sub> silicon penta iodide SiI<sub>5</sub>

### Molecular and Ionic Compounds

Use your data book. Remember that spelling mistakes and missing brackets are ERRORS.

Name each of the following:

1. NaF<sup>+ -</sup> sodium fluoride

Ra(NO<sub>2</sub>)<sub>2</sub> radium nitrite

2. SnF<sub>2</sub><sup>2+ -</sup> tin(II) fluoride

Bi(OH)<sub>3</sub> bismuth(III) hydroxide

3. C<sub>2</sub>H<sub>6</sub> dicarbon hexahydride

Am(C<sub>6</sub>H<sub>5</sub>COO)<sub>4</sub> americium(IV) benzoate

4. Cu<sub>2</sub>(SO<sub>4</sub>) copper(II) sulfate

SnSO<sub>3</sub> tin(II) sulfite

5. CrSO<sub>4</sub> chromium(II) sulfate

TlHSO<sub>3</sub> thallium(I) hydrogen sulfite

6. KMnO<sub>4</sub> potassium permanganate

SeP<sub>5</sub> selenium pentaphosphide

7. Au(NO<sub>3</sub>)<sub>3</sub> gold(III) nitrate

PbO lead(II) oxide

8. Si<sub>2</sub>F<sub>3</sub> disilicon trifluoride

RuO<sub>2</sub> manganese(II) oxide

9. Fe(CIO)<sub>3</sub> iron(III) hypochlorite

Po(CN)<sub>2</sub> polonium(II) cyanide

10. IrBr<sub>4</sub> iridium bromide

PI<sub>6</sub> phosphorus hexaiodide



## Molecular and Ionic Compounds

Name

Key

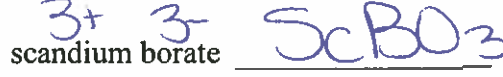
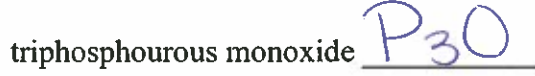
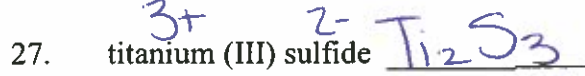
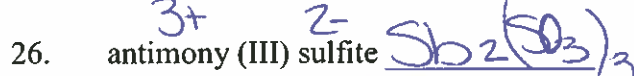
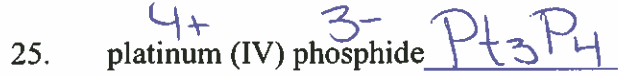
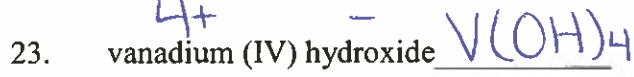
Use your data book. Remember that spelling mistakes and missing brackets are ERRORS.

A. Name each of the following:

1.  $\text{NaF}$  <sup>+</sup><sub>Na</sub> <sup>-</sup><sub>F</sub> sodium fluoride  $\text{Ra}(\text{NO}_2)_2$  radium nitrite
2.  $\text{SnF}_2$  <sup>2+</sup><sub>Sn</sub> <sup>-</sup><sub>F</sub> tin(II) fluoride  $\text{Bi}(\text{OH})_3$  bismuth(III) hydroxide
3.  $\text{C}_2\text{H}_6$  dicarbon hexahydride  $\text{Am}(\text{C}_6\text{H}_5\text{COO})_4$  americium(IV) benzoate
4.  $\text{Cu}_2(\text{SO}_4)$  <sup>2+</sup><sub>Cu</sub> <sup>2-</sup><sub>SO4</sub> copper(II) sulfate  $\text{SnSO}_3$  <sup>2-</sup><sub>SO3</sub> tin(II) sulfite
5.  $\text{CrSO}_4$  <sup>2+</sup><sub>Cr</sub> <sup>2-</sup><sub>SO4</sub> chromium(II) sulfate  $\text{TIHSO}_3$  <sup>-</sup><sub>SO3</sub> thallium(I) hydrogen sulfite
6.  $\text{KMnO}_4$  potassium permanganate  $\text{SeP}_5$  selenium pentaphosphide
7.  $\text{Au}(\text{NO}_3)_3$  <sup>3+</sup><sub>Au</sub> <sup>-</sup><sub>NO3</sub> gold(III) nitrate  $\text{PbO}$  lead(II) oxide
8.  $\text{Si}_2\text{F}_3$  disilicon trifluoride  ~~$\text{RuO}_2$~~  <sup>2+</sup><sub>Ru</sub> <sup>2-</sup><sub>O2</sub> manganese(II) oxide
9.  $\text{Fe}(\text{OCl})_3$  <sup>-</sup><sub>OCl</sub> iron(III) hypochlorite  $\text{Po}(\text{CN})_2$  <sup>-</sup><sub>CN</sub> polonium(II) cyanide
10.  $\text{IrBr}_4$  iridium bromide  $\text{PI}_6$  phosphorus hexaiodide
11.  $\text{Ba}(\text{NO}_3)_2$  <sup>-</sup><sub>NO3</sub> barium nitrate  $\text{CuHSO}_3$  copper(I) hydrogen sulfite
12.  $\text{NiO}$  nickel(II) oxide  $\text{Pd}(\text{ClO}_3)_2$  <sup>-</sup><sub>ClO3</sub> palladium(II) chlorate
13.  $\text{N}_2\text{O}_5$  dinitrogen pentoxide  $\text{LaPO}_4$  lanthanum phosphate
14.  $\text{BeCl}_2$  beryllium chloride  $\text{Nd}(\text{OH})_3$  neodymium hydroxide
15.  $\text{Fe}(\text{NO}_3)_2$  <sup>-</sup><sub>NO3</sub> iron(II) nitrate  $\text{S}_6\text{H}_3$  hexasilfen trihydride



B. Give the formula for each.



- |   |  |
|---|--|
| 11. Ba(NO <sub>3</sub> ) <sub>2</sub> <u>barium nitrate</u>   | CuHSO <sub>3</sub> <u>copper(I) hydrogen sulfite</u>             |
| 12. NiO <u>Nickel(II) oxide</u>                               | Pd(ClO <sub>3</sub> ) <sub>2</sub> <u>palladium(II) chlorate</u> |
| 13. N <sub>2</sub> O <sub>5</sub> <u>dinitrogen pentoxide</u> | LaPO <sub>4</sub> <u>lanthanum phosphate</u>                     |
| 14. BeCl <sub>2</sub> <u>beryllium chloride</u>               | Nd(OH) <sub>3</sub> <u>neodymium hydroxide</u>                   |
| 15. Fe(NO <sub>3</sub> ) <sub>2</sub> <u>iron(II) nitrate</u> | S <sub>6</sub> H <sub>3</sub> <u>hexasulfur trihydride</u>       |

Give the formula for each.

- |  |  |
|--|--|
| 16. lithium sulfite <sup>+ 2-</sup> <u>Li<sub>2</sub>SO<sub>3</sub></u>                      | copper(II) hypochlorite <sup>2+ -</sup> <u>Cu(ClO)<sub>2</sub></u>     |
| 17. strontium bromide <sup>2+ -</sup> <u>SrBr<sub>2</sub></u>                                | bismuth(V) oxide <sup>5+ 2-</sup> <u>Bi<sub>2</sub>O<sub>5</sub></u>   |
| 18. ammonium fluoride <sup>+ -</sup> <u>NH<sub>4</sub>F</u>                                  | dinitrogen monoxide <u>N<sub>2</sub>O</u>                              |
| 19. silver carbonate <sup>+ 2-</sup> <u>Ag<sub>2</sub>CO<sub>3</sub></u>                     | calcium carbonate <sup>2+ 2-</sup> <u>CaCO<sub>3</sub></u>             |
| 20. cobalt(II) sulfide <sup>2+ 2-</sup> <u>CoS</u>   | magnesium carbonate <sup>2+ 2-</sup> <u>MgCO<sub>3</sub></u>           |
| 21. oxygen difluoride <u>OF<sub>2</sub></u>  | sulfur trichloride <u>SCl<sub>3</sub></u>                              |
| 22. tin(II) iodide <sup>2+ -</sup> <u>SnI<sub>2</sub></u>                                    | strontium bromide <sup>2+ -</sup> <u>SrBr<sub>2</sub></u>              |
| 23. vanadium(IV) hydroxide <sup>4+ -</sup> <u>V(OH)<sub>4</sub></u>                          | iron(II) nitrite <sup>2+ -</sup> <u>Fe(NO<sub>2</sub>)<sub>2</sub></u> |
| 24. tricarbon difluoride <u>C<sub>3</sub>F<sub>2</sub></u>                                   | krypton dihydride <u>KrH<sub>2</sub></u>                               |
| 25. platinum(IV) phosphide <sup>4+ 3-</sup> <u>Pt<sub>3</sub>P<sub>4</sub></u>               | rhenium chloride <sup>7+ -</sup> <u>ReCl<sub>7</sub></u>               |
| 26. antimony(III) sulfite <sup>3+ 2-</sup> <u>Sb<sub>2</sub>(SO<sub>3</sub>)<sub>3</sub></u> | triphenosurous monoxide <u>P<sub>3</sub>O</u>                          |
| 27. titanium(III) sulfide <sup>3+ 2-</sup> <u>Ti<sub>2</sub>S<sub>3</sub></u>                | pentasulfur tetrachloride <u>S<sub>5</sub>Cl<sub>4</sub></u>           |
| 28. zinc hydrogen phosphate <sup>2+ 2-</sup> <u>ZnHPO<sub>4</sub></u>                        | scandium borate <sup>3+ 3-</sup> <u>ScBO<sub>3</sub></u>               |
| 29. gallium silicate <sup>3+ 2-</sup> <u>Ga<sub>2</sub>(SiO<sub>3</sub>)<sub>3</sub></u>     | nitrogen dichloride <u>NCl<sub>2</sub></u>                             |

30. ammonium sulfate  $(\text{NH}_4)_2\text{SO}_4$  cobalt (III) oxide  $\text{Co}_2\text{O}_3$

**Lesson 8: Solubility Table**

Use your textbook p. 54 -75 to answer the following questions.

1. Ionic compounds share many properties. Define the following terms.

a. High Melting Point

b. Crystal Shape

c. Solubility in Water

d. Conductivity in Solution

more conductive with greater concentration of ions in solution

e. Solubility

dissolve in water or other solvent

2. Determine the solubility of the following using the table on p. 57. Use the subscript  $(aq)$  for those very soluble and the subscript  $(s)$  for those slightly soluble.

$(\text{NH}_4)_2\text{S}$ (aq)	$\text{AgCl}$ (s)	$\text{PbSO}_4$ (s)	$\text{Sr}(\text{OH})_2$ (aq)	$\text{Fe}(\text{OH})_3$ (s)
$\text{Au}(\text{NO}_3)_3$ (aq)	$\text{PbI}_4$ (aq)	$\text{Na}_3\text{PO}_4$ (aq)	$\text{CuS}$ (s)	$\text{AgCH}_3\text{COO}$ (s)

3. Determine the chemical formula for each of the following and if it is soluble or slightly soluble in water.

4.

Chemical	Formula and Solubility
potassium carbonate	$\text{K}_2\text{CO}_3$ (aq)

iron (II) nitrate	$\text{Fe}(\text{NO}_3)_2(\text{aq})$
Copper (I) chloride	$\text{CuCl}(\text{s})$
barium hydroxide	$\text{Ba}(\text{OH})_2(\text{s})$
ammonium sulfite	$(\text{NH}_4)_2\text{SO}_3(\text{aq})$
calcium sulfite	$\text{CaSO}_3(\text{s})$
lead (IV) bromide	$\text{PbBr}_4(\text{aq})$

5. Describe these properties of molecular compounds:

- Covalent bonds : strong bonds formed when non-metal atoms share electrons
- Melting points : lower than ionic compounds
- Crystalline shape : molecular crumble easily
- Conduct electricity : molecular do not conduct electricity as a solid or in solution

6. Read the section on p. 60 and describe how a water molecule is formed.

liquid water molecules are held together through the attractions caused by each molecule being slightly polar (one pos. & one neg. end)

7. How does water act during the summer and winter months?

Summer: oceans a heat sink, absorbing heat from Sun and air

Winter: Oceans act as a heat source, radiating stored heat.

8. Describe how ice is formed.

molecules spread out and line up in a 3D array that contains 6-sided rings, hence we have 6-sided snowflakes

9. An acid has a pH lower than 7 and a base has a pH higher than 7.

10. pH measures hydrogen ions in a solution.

11. Why is your saliva slightly basic?

so your teeth won't dissolve in acids like fruit juices

12. Your stomach makes hydrochloric acid. What does this acid do?

acts like a chemical switch turning enzymes into pepsin, speeding up digestion

13. What does the pancreas produce and why is it important?

sodium hydrogen carbonate, a base like baking soda that neutralizes stomach acid, deactivating the pepsin

14. Define buffer.

keeps pH of a solution nearly constant despite the addition of small amounts of acid or base

15. Using litmus paper acids turn the paper red and bases turn the paper blue.

16. What is a universal indicator?

a mixture of several different indicators that change colour as acidity changes

17. A solution of pH 9 is 10 times more basic than a solution of pH 8.

18. A solution of pH 1 is 10 times more acidic than a solution of pH 2.

19. Fill in the following chart.

Property	Acid	Base
Taste	sour	bitter
Touch	not slippery	slippery
Reaction with Metals	metal corrodes, H <sub>2</sub> bubbles	no reaction

Litmus Indicator	red	blue
Electrical Conductivity	conductive	conductive
pH of solution	< 7	> 7

20. How are acids named?

1) Only 2 elements: ionic name hydrogen becomes hydro- and add -ic to end (eg.) hydrobromic acid)  
 2) more than 2: -ite becomes -ous, -ate becomes HBR

21. How are bases named?

end in hydroxide (eg. NaOH sodium hydroxide)

22. List 2 examples of common household acids and 2 examples of common household bases.

Acids: Vinegar  
 battery acid

Bases: drain cleaner  
 antacid.

23. Describe what neutralization is.

when acids and bases react together and both acidic and basic properties disappear.

24. Determine whether the following substances are an acid, base, or neither.

Substance	Type
KOH <sub>(aq)</sub>	base
H <sub>2</sub> SO <sub>4(aq)</sub>	acid
NaCl <sub>(aq)</sub>	neither
CH <sub>3</sub> COOH <sub>(aq)</sub>	acid
HCl <sub>(aq)</sub>	acid
Mg(OH) <sub>2(aq)</sub>	base
C <sub>6</sub> H <sub>5</sub> COOH <sub>(aq)</sub>	acid

25. Mercury is used in batteries. How is mercury harmful to our environment?

it's a poison, bad for environment, animals, and humans who eat animals

26. What are chlorofluorocarbons (CFC) and how are they harmful to our environment?

non-toxic chemicals used in cooling systems. When released into atmosphere they act as a catalyst causing the destruction of the ozone layer.

27. Alcohol can be a chemical toxin.

- a. What type of alcohol do people drink, name and formula?

ethanol:  $\text{CH}_3\text{CH}_2\text{OH}$  (a)

- b. What does alcohol destroy?

liver, kidney, and brain cells.

- c. Alcohol use can become an addiction; describe the physical and psychological effects an alcohol addiction can have on a person.

physical: body needs the drug to function  
psychological: drug is linked to moods/feelings

28. Nicotine and other tobacco products:

- a. What is the most common source of nicotine?

Cigarettes

- b. Cigarette smoke contains carbon monoxide, which is more dangerous than polluted air.

- c. How many chemicals are in cigarette smoke? ~3000

29. List 4 things benzene is used for.

- dyes, detergents, medicines, plastics.

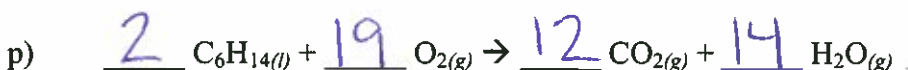
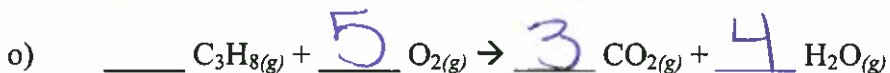
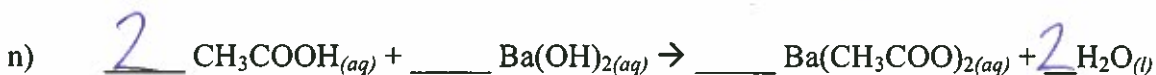
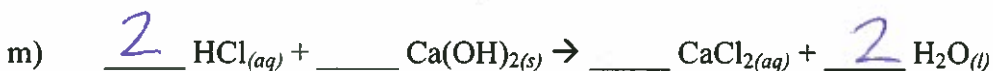
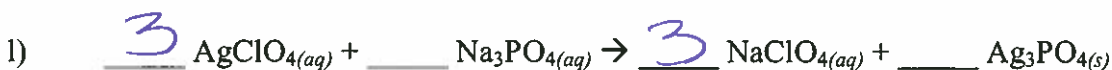
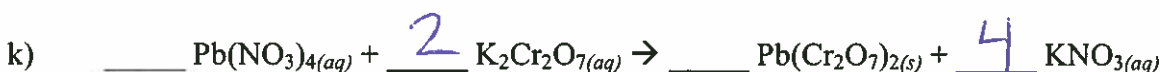
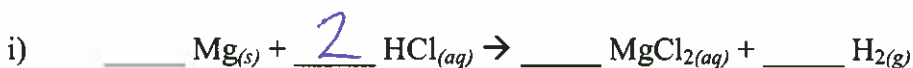
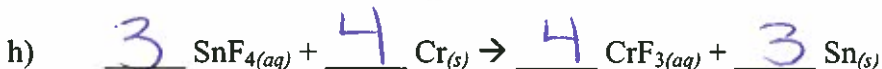
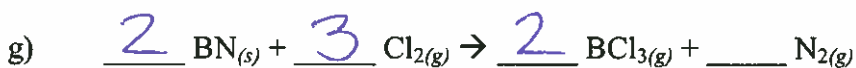
**Lesson 9: Chemical Change**

No questions.



## Lesson 10: Chemical Equations

1. Balance the following chemical equations:



2. Balance the following chemical equations:

- a)  $\underline{2} \text{Pb}_{(s)} + \underline{\quad} \text{O}_{2(g)} \rightarrow \underline{2} \text{PbO}_{(s)}$
- b)  $\underline{\quad} \text{N}_{2(g)} + \underline{3} \text{H}_{2(g)} \rightarrow \underline{2} \text{NH}_{3(g)}$
- c)  $\underline{2} \text{Na}_{(s)} + \underline{2} \text{H}_2\text{O}_{(l)} \rightarrow \underline{2} \text{NaOH}_{(aq)} + \underline{\quad} \text{H}_{2(g)}$
- d)  $\underline{2} \text{C}_4\text{H}_{10(g)} + \underline{13} \text{O}_{2(g)} \rightarrow \underline{8} \text{CO}_{2(g)} + \underline{10} \text{H}_2\text{O}_{(g)}$
- e)  $\underline{\quad} \text{H}_3\text{PO}_{4(aq)} + \underline{3} \text{KOH}_{(aq)} \rightarrow \underline{\quad} \text{K}_3\text{PO}_{4(aq)} + \underline{3} \text{H}_2\text{O}_{(l)}$
- f)  $\underline{\quad} \text{C}_5\text{H}_{12(l)} + \underline{8} \text{O}_{2(g)} \rightarrow \underline{5} \text{CO}_{2(g)} + \underline{6} \text{H}_2\text{O}_{(g)}$
- g)  $\underline{\quad} \text{Zn}_3\text{N}_{2(s)} + \underline{6} \text{H}_2\text{O}_{(l)} \rightarrow \underline{3} \text{Zn(OH)}_{2(aq)} + \underline{2} \text{NH}_{3(g)}$
- h)  $\underline{\quad} \text{Fe}_3\text{O}_{4(s)} + \underline{4} \text{H}_{2(g)} \rightarrow \underline{3} \text{Fe}_{(s)} + \underline{4} \text{H}_2\text{O}_{(l)}$
- i)  $\underline{2} \text{Al}_{(s)} + \underline{3} \text{H}_2\text{SO}_{4(aq)} \rightarrow \underline{3} \text{H}_{2(g)} + \underline{\quad} \text{Al}_2(\text{SO}_4)_{3(aq)}$
- j)  $\underline{2} \text{CrS}_{(s)} + \underline{3} \text{O}_{2(g)} \rightarrow \underline{2} \text{CrO}_{(s)} + \underline{2} \text{SO}_{2(g)}$
- k)  $\underline{\quad} \text{HClO}_{3(aq)} + \underline{5} \text{HCl}_{(aq)} \rightarrow \underline{3} \text{H}_2\text{O}_{(l)} + \underline{3} \text{Cl}_{2(g)}$
- l)  $\underline{3} \text{CaC}_2_{(s)} + \underline{2} \text{AsBr}_3_{(aq)} \rightarrow \underline{6} \text{C}_{(s)} + \underline{2} \text{As}_{(s)} + \underline{3} \text{CaBr}_2_{(aq)}$
- m)  $\underline{\quad} 4 \text{NH}_3_{(g)} + \underline{\quad} 5 \text{O}_2_{(g)} \rightarrow \underline{\quad} 4 \text{NO}_{(g)} + \underline{\quad} 6 \text{H}_2\text{O}_{(l)}$
- n)  $\underline{2} \text{HNO}_3_{(aq)} + \underline{\quad} \text{NO}_{(g)} \rightarrow \underline{3} \text{NO}_2_{(g)} + \underline{\quad} \text{H}_2\text{O}_{(l)}$
- o)  $\underline{\quad} \text{Al(NO}_3)_3_{(aq)} + \underline{3} \text{NaOH}_{(aq)} \rightarrow \underline{3} \text{NaNO}_3_{(aq)} + \underline{\quad} \text{Al(OH)}_3_{(s)}$
- p)  $\underline{\quad} \text{C}_2\text{H}_5\text{OH}_{(l)} + \underline{3} \text{O}_2_{(g)} \rightarrow \underline{2} \text{CO}_2_{(g)} + \underline{3} \text{H}_2\text{O}_{(g)}$
- q)  $\underline{2} \text{NaIO}_3_{(s)} \rightarrow \underline{2} \text{NaI}_{(s)} + \underline{3} \text{O}_2_{(g)}$

### Lesson 11: Formation Reactions

Provide either the balanced reaction using symbols or provide the word equation.

1. sodium and chlorine make sodium chloride



2. manganese, carbon and oxygen make manganese (II) carbonate



3. lithium, nitrogen and oxygen make lithium nitrite



4. chromium, carbon and nitrogen make chromium (III) cyanide



5. iron, phosphorus, and oxygen make iron (III) phosphate



6. zinc, silicon and oxygen make zinc silicate



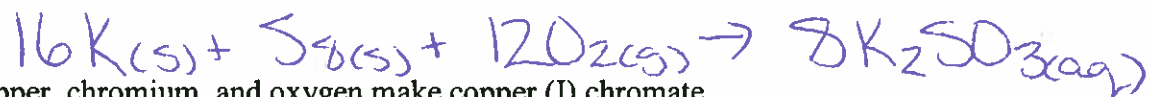
7. magnesium, hydrogen and sulfur make magnesium hydrogen sulfide



8. nickel, oxygen, and hydrogen make nickel (III) hydroxide



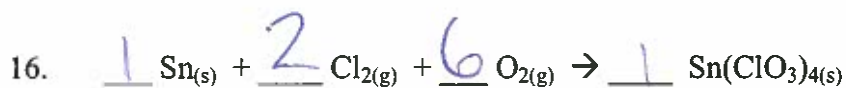
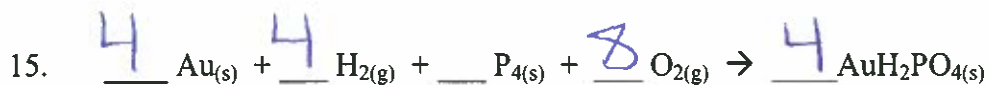
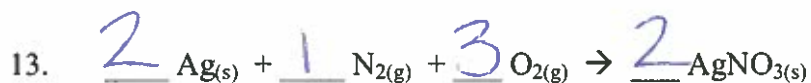
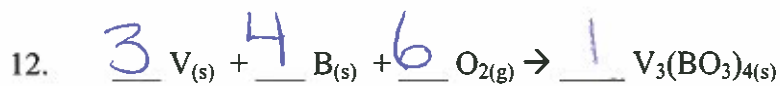
9. potassium, sulfur and oxygen make potassium sulfite



10. copper, chromium, and oxygen make copper (I) chromate



11. 2 Na<sub>(s)</sub> + 1 Cl<sub>2(g)</sub> → 2 NaCl<sub>(s)</sub>



**Lesson 12: Decomposition Reactions**

Provide either the balanced reaction using symbols or provide the word equation.

1. barium hydroxide decomposes to barium, hydrogen and oxygen



2. aluminium carbonate decomposes to aluminium, carbon and oxygen



3. mercury (II) nitrite decomposes to mercury, nitrogen and oxygen



4. antimony (V) cyanide decomposes to antimony, carbon and nitrogen



5. scandium borate decomposes to scandium, boron and oxygen



6. sodium dichromate decomposes to sodium, chromium and oxygen



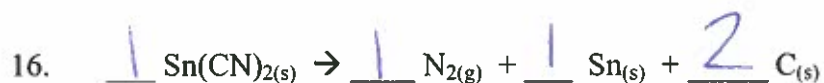
7. francium chloride decomposes to francium and chlorine



8. propane decomposes to carbon and hydrogen



10.  $\underline{2}$   $\text{H}_2\text{O}(\text{l}) \rightarrow \underline{2}$   $\text{H}_2(\text{g}) + \underline{1}$   $\text{O}_2(\text{g})$



**Lesson 13: Single Replacement Reactions**

Provide the balanced reaction using symbols.

1. tin reacts with copper (II) sulfate to form copper and tin (IV) sulfate



2. aluminium reacts with iron (III) nitrate to form iron and aluminium nitrate



3. nitrogen reacts with lithium fluoride to form fluorine and lithium nitride



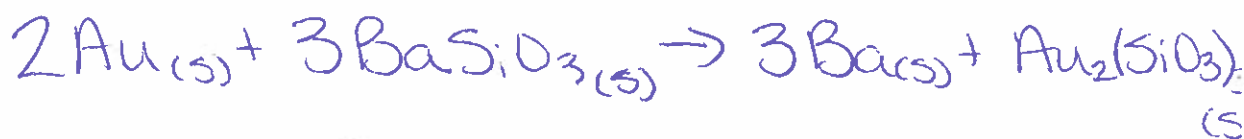
4. chromium reacts with manganese (II) oxide to form manganese and chromium (III) oxide



5. mercury reacts with calcium chlorate to form calcium and mercury (II) chlorate



6. gold reacts with barium silicate to form barium and gold (III) silicate



7. magnesium chloride reacts with oxygen to form magnesium oxide and chlorine

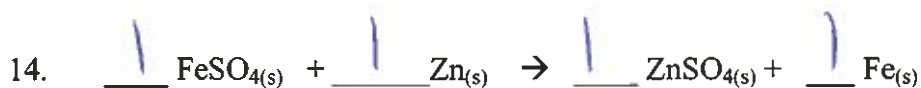
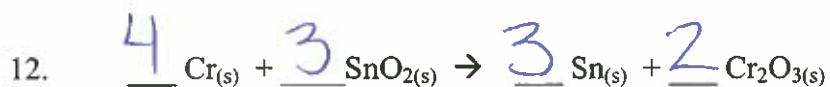
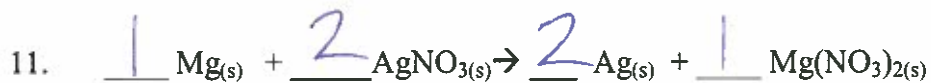
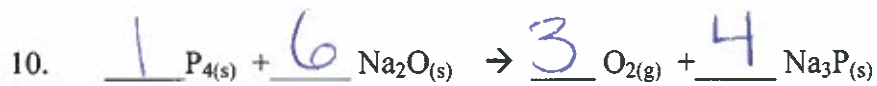


8. zinc reacts with nickel (III) hydroxide to form nickel and zinc hydroxide



9. 1 Zn<sub>(s)</sub> + 1 Mg(OH)<sub>2(s)</sub> → 1 Mg<sub>(s)</sub> + 1 Zn(OH)<sub>2(s)</sub>





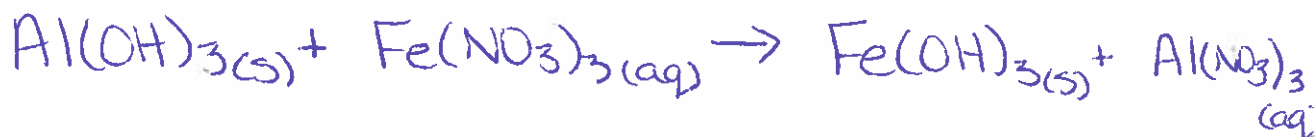
**Lesson 14: Double Replacement Reactions**

Provide the balanced reaction using symbols.

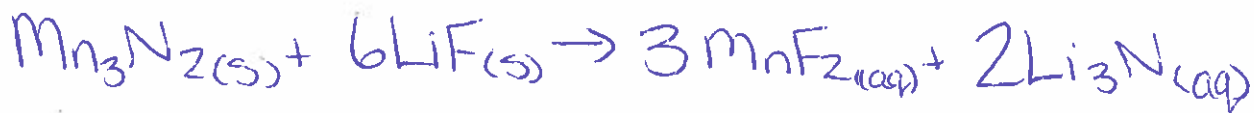
1. tin (IV) oxide reacts with nickel (II) sulfate to form tin (IV) sulfate and nickel (II) oxide



2. aluminium hydroxide reacts with iron (III) nitrate to form iron (III) hydroxide and aluminium nitrate



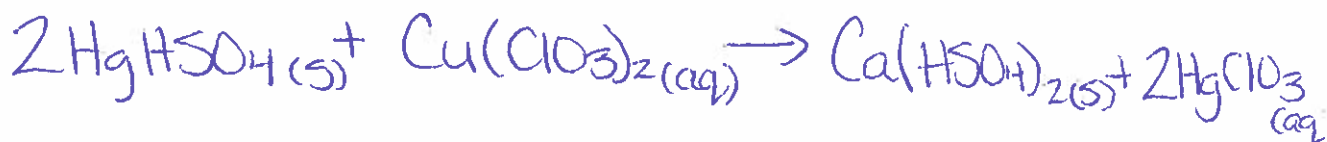
3. manganese (II) nitride reacts with lithium fluoride to form manganese (II) fluoride and lithium nitride



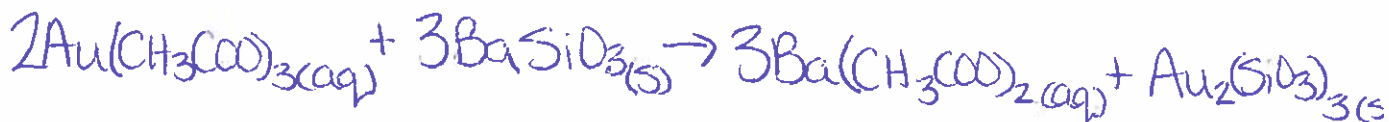
4. chromium (II) nitrite reacts with manganese (IV) oxide to form manganese (IV) nitrite and chromium (II) oxide



5. mercury (I) hydrogen sulfate reacts with calcium chlorate to form calcium hydrogen sulfate and mercury (I) chlorate



6. gold (III) acetate reacts with barium silicate to form barium acetate and gold (III) silicate

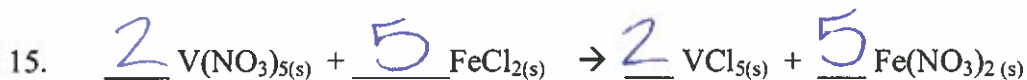
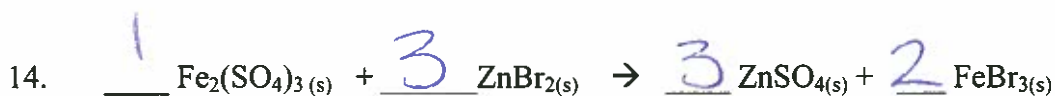
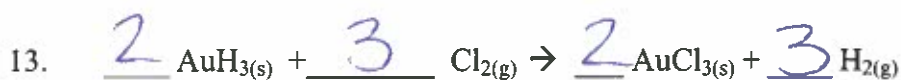
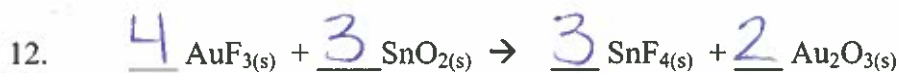
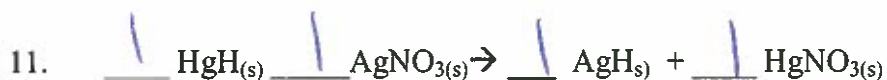
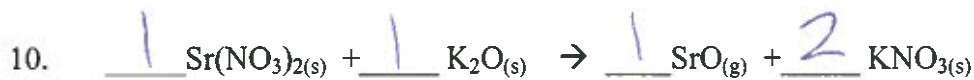
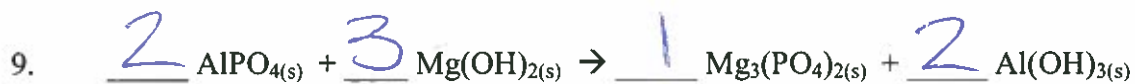


7. magnesium chloride reacts with aluminium borate to form magnesium borate and aluminium chloride



8. zinc phosphate reacts with nickel (III) hydroxide to form nickel (III) phosphate and zinc hydroxide





### Lesson 15: Combustion Reactions

Write and balance the combustion equations for the following.

1. Methane



2. Ethane



3. Propane



4. Butane



5. Pentane



6. Hexane



7. Octane



8. Glucose



9. Ethanol



10. Methanol



**Lesson 16: The Mole**

Fill in the missing values below:

	Formula	Name	Molar Mass
--	---------	------	------------

1	$C_3H_{10}$	tricarbon decahydride	$3(12.01) + 10(1.01)$ $= 46.13 \text{ g/mol}$
2	NaCl	Sodium chloride	$22.99 + 35.45$ $= 58.44 \text{ g/mol}$
3	CH <sub>4</sub>	methane	$12.01 + 4(1.01)$ $= 16.05 \text{ g/mol}$
4	$Mg(CN)_2(s)$	magnesium cyanide	$24.31 + 2(12.01) + 2(14.01)$ $= 76.35 \text{ g/mol}$
5	MnO <sub>2</sub>	Manganese (IV) oxide	$54.94 + 2(16.00)$ $= 86.94 \text{ g/mol}$
6	$Ca(NO_3)_2(s)$	calcium nitrate	$40.08 + 2(14.01) + 6(16.00)$ $= 164.10 \text{ g/mol}$
7	NO <sub>3</sub>	Nitrogen trioxide	$14.01 + 3(16.00)$ $= 62.01 \text{ g/mol}$
8	KBr <sub>(s)</sub>	potassium bromide	$39.10 + 79.90$ $= 119.00 \text{ g/mol}$
9	NiCl <sub>2</sub>	Nickel (II) chloride	$58.69 + 2(35.45)$ $= 129.59 \text{ g/mol}$
10	ZnCO <sub>3</sub>	Zinc Carbonate	$65.41 + 12.01 + 3(16.00)$ $= 125.42 \text{ g/mol}$

2. Fill in the missing information using the formula  $n = \frac{m}{M}$

---

	Formula	Name			DEFINED M (g/mol)	MEASURED mass (g)	MEASURED Moles (mol)
1	$\text{Li}_2\text{CO}_3$	lithium carbonate + 2-	Li C O	2 1 3	6.94 12.01 16.00	73.89	25.0 0.338
2	$\text{MgSO}_4$	magnesium sulfate	Mg S O		120.38	300	2.49
3	$\text{C}_6\text{H}_6$	benzene	C H		78.12	117.18	1.50
4	$\text{NiCl}_3$	nickel (III) chloride 3+ -	Ni Cl		165.04	412.60	2.5
5	$\text{Na}_2\text{OCCOO}$	sodium oxalate	Na O C	2 4 2	134.00	500	3.73
6	$\text{H}_2\text{O}$	water	H O		18.02	64.90	3.60
7	$\text{HNO}_3$	hydrogen nitrate	H N O		63.02	100	1.59
8	$\text{Sn}(\text{ClO})_4$	tin(IV) hypochlorite	Sn Cl O		324.51	150	0.462
9	$\text{Pb}(\text{CO}_3)_2$	lead (IV) carbonate	Pb C O		327.22	490.83	1.50
10	$\text{K}_3\text{PO}_4$	potassium phosphate	K P O		212.27	50	0.236



29

ix  
xix  
xi

