Summary: P808 # 1-12

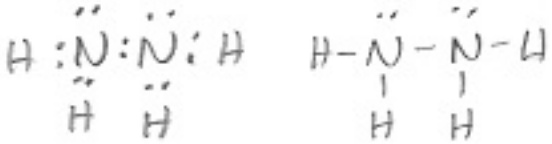
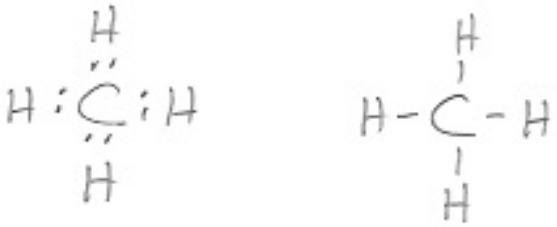
1)
a) $^{7}_{3}Li$ b) $^{40}_{20}Ca^{2+}$ c) $^{16}_{8}O^{2-}$ d) $^{14}_{6}C$

2) When the gas is heated, electrons in the gas atom will be excited and 'jump' up to higher energy levels. After a very short period of time (milli or micro seconds), the electrons will 'fall' back down to their original energy levels, releasing the energy they had originally absorbed as photons, which we detect as light.

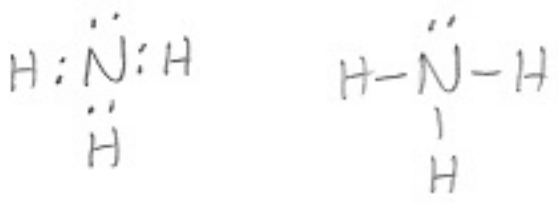
3)
Chlorine's most likely charge is -1, as it needs one more electron to fill its third energy level.
Potassium's most likely charge is +1, as it has only one electron in its fourth energy level, and will lose it to empty the energy level.
Calcium's most likely charge is +2, as it has only two electrons in its fourth energy level, and will lose them to empty the energy level.

4)
a) Cl - Cl will form a covalent bond, as both are non-metals
b) K - I will for an ionic bond, as one is a metal and the other is a non-metal
c) C - O will for a covalent bond, as both are non-metals
d) Mg - F will form an ionic bond, as one is a metal and the other is a non-metal

5)

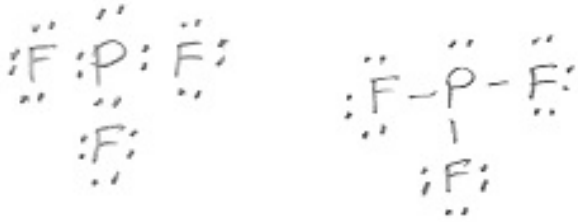
a) 	f) 
b) 	g) 

c)



h)

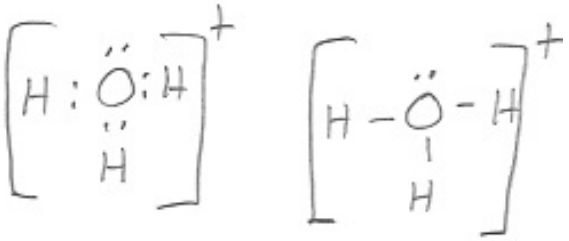
d)



i)

e)

j)



6)

a) O-H b) C-O c) C-H d) O-H e) H-Cl

7) CCl_4 should be a non-polar substance. Although each C-Cl bond is a polar covalent bond, these four bonds are arranged in a tetrahedral arrangements. Since polar bonds add their dipoles as vectors, the four equal dipoles will add up to a zero dipole.

8)

a) $AlCl_{3(s)}$ b) $CuSO_{4(s)}$ c) $Ca(OH)_{2(s)}$ d) $Pb(NO_3)_{2(s)}$ e) $H_2SO_{4(aq)}$
f) $FeI_{2(s)}$ g) $NH_4NO_{3(s)}$ h) $Na_3PO_{4(s)}$ I) $SnBr_{4(s)}$ j) $Fe_2(CO_3)_{3(s)}$
k) $K_2Cr_2O_{7(s)}$ l) $Co_2(SO_4)_{3(s)}$

9)
a) copper(I) chloride b) iron(III) oxide c) lead(IV) iodide
d) sulfur(VI) fluoride e) ammonium chlorate
f) copper(II) nitrate g) aqueous hydrogen chloride
h) phosphorus (IV) oxide I) tin(IV) hydride
j) calcium bicarbonate or calcium hydrogen carbonate k) potassium permanganate
l) copper(II) sulfate pentahydrate

10)
a) $Fe + 2CuNO_3 \rightarrow Fe(NO_3)_2 + 2Cu$, single displacement
b) $P_4 + 5O_2 \rightarrow 2P_2O_5$, synthesis
c) $CaCO_3 \rightarrow CaO + CO_2$, decomposition
d) $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$, combustion
e) $Pb(OH)_2 \rightarrow PbO + H_2O$, decomposition
f) $2NH_3 + H_2SO_4 \rightarrow (NH_4)_2SO_4$, synthesis
g) $2K_3PO_4 + 3MgCl_2 \rightarrow 6KCl + Mg_3(PO_4)_2$, double displacement

11)
a) $Cu_{(s)} + HCl_{(aq)} \rightarrow NR$
b) $Au_{(s)} + ZnSO_{4(aq)} \rightarrow NR$
c) $Pb_{(s)} + CuSO_{4(aq)} \rightarrow PbSO_{4(s)} + Cu_{(s)}$
d) $Cl_{2(g)} + 2NaBr_{(aq)} \rightarrow Br_{2(l)} + 2NaCl_{(aq)}$
e) $Fe_{(s)} + 3AgNO_{3(aq)} \rightarrow Fe(NO_3)_3 + 3Ag$

12)
a) $CuCl_{2(aq)} + Mg(NO_3)_{2(aq)} \rightarrow Cu(NO_3)_{2(aq)} + MgCl_{2(aq)}$ will not proceed, all (aq)
b) $(NH_4)_2SO_{4(aq)} + AgNO_{3(aq)} \rightarrow Ag_2SO_{4(s)} + 2NH_4NO_{3(aq)}$, will proceed, one (s) in products
c) $Ba(OH)_{2(aq)} + K_2SO_{4(aq)} \rightarrow BaSO_{4(s)} + 2KOH_{(aq)}$, will proceed, one (s) in products