Solubility Rules:

SOLUBLE COMPOUNDS:	**EXCEPTIONS:**
Those containing:	
NO_3^-, ClO_3^-, ClO_4^-,	NONE
acetate (CH_3COO^-),	Ag^+ salt is only slightly soluble
Cl^-, Br^-, I^-,	salts of Ag^+, Cu^+, Hg_2^{2+}, and Pb^{2+}
sulfate (SO_4^{2-})	salts of Ca^{2+}, Pb^{2+}, Sr^{2+}, Hg_2^{2+}, and Ba^{2+} (Ag^+ is slightly soluble)

INSOLUBLE COMPOUNDS:	**EXCEPTIONS:**
Those containing:	
S^{2-}, OH^-, O^{2-}	Ca^{2+}, Sr^{2+}, and Ba^{2+} and *
CO_3^{2-}, PO_4^{3-}, SO_3^{2-}	ONLY *

*All salts of alkali metals are soluble. All ammonium (NH_4^+) salts are soluble.

NOTE: Soluble oxides, O^{2-}, react with water to produce 2 OH^-.

Oxidation Number Assignation Rules:

These rules MUST be followed in order. The lower numbered rules take precednce over the higher numbered ones. Therefore, fulfill the lowers ones first, then the higher ones.

0. The sum of all the oxidation numbers (ox#) in the compound must equal the net charge on the compound.

1. All elements in their pure state (i.e. not bound to any different element) have a zero (0) ox#.

In multi-elemental compounds:

2. Fluorine always has an ox# of –1.

3. All alkali metals (Li, Na, ...) have an ox# of +1.

4. All alkaline earth metals (Mg, Ca,...) have an ox# of +2.

5. Hydrogen has an ox# of +1, unless bound to a metal when it has an ox# of -1 (and is called a hydride)

6. Oxygen has an ox# of –2, except in peroxides (ox#=–1) and superoxides (ox#=$-^1/_2$); note, both have oxygen bound to another oxygen.

7. Halogens (Cl, Br, I,...) usually have –1 ox#, unless bound to oxygen when the ox# is positive and variable.

8. Metals always have positive ox#s.

9. Main Group elements often have ox#s that can vary from +(group number) to (8 – group number).

Balancing Redox Reactions Using the Ion-Electron Method:

1. Break the reaction up into half reactions; there should be at least one oxidation and one reduction.

2. In each half reaction, balance all the non-H and non-O atoms.

In Acid:	In Base:
3. Balance all O atoms by adding 2 H^+ to the side with the O, and H_2O to the side without, for each O.	3. Balance all H atoms by adding OH^- to the side with H, and H_2O to the side without, for each H.
4. Balance the H atoms by adding an H^+ to the side without, for each H.	4. Balance the O atoms by adding H_2O the side with the O, and 2 OH^- to the side without, for each O.

5. Balance the charges in each half reaction by adding electrons (e^-) to the more positive side.

6. Add the half reactions in such a way as to cancel out the electrons from the overall equation.