

Solubility Rules			
Rule	Substances		Exceptions
1	Group 1 cations and ammonium ion	always soluble	none
2	acetates and nitrates	always soluble	none
3	halogens (as anions)	always soluble	Ag ⁺ , Hg ₂ ²⁺ , Hg ²⁺ , or Pb ²⁺
4	sulfates	always soluble	Ag ⁺ , Hg ₂ ²⁺ , Hg ²⁺ , Pb ²⁺ , Ca ²⁺ , Sr ²⁺ , or Ba ²⁺
5	carbonates, phosphates, sulfides, and hydroxides	always insoluble	Group 1 and Group II hydroxides are strong bases

Rules for Determining Oxidation Numbers	
Rule 1	the oxidation number of atoms in their elemental state is zero
Rule 2	the oxidation number of a monatomic ion is equal to its charge
Rule 3	the oxidation number of oxygen is always equal to -2 unless in a peroxide (then -1)
Rule 4	the oxidation number of hydrogen is always +1 unless in a hydride (then -1)
Rule 5	Fluorine always has an oxidation number of -1. The other halogens always have an oxidation of -1 as anions in binary compounds. Halogens listed as the first member of a binary molecular compound or involved in oxyanions have positive oxidation numbers.
Rule 6	for either a neutral compound or for any polyatomic ion, the sum of the oxidation numbers of the atoms in the molecule is equal to the net charge on the specie
note	it <u>is</u> possible for atoms to have fractional oxidation numbers, but. . . .

Equations:

$$q = (\text{specific heat}) \times m \times \Delta T$$

$$\Delta H^\circ_{\text{rxn}} = \sum \Delta H^\circ_{\text{f, products}} - \sum \Delta H^\circ_{\text{f, reactants}}$$