Polyatomic Ions to Know

Memorize the names, formulas, and charges of the polyatomic ions below:

+1		
Ammonium NH_4^+		
-1	**-2**	**-3**
Acetate $C_2H_3O_2^-$ or CH_3COO^-	Carbonate CO_3	Arsenate AsO_4
Bromate BrO_3^-	Chromate CrO_4	Phosphate PO_4
Perchlorate ClO_4^-	Dichromate Cr_2O_7	Phosphite PO_3
Chlorate ClO_3^-	Oxalate C_2O_4	
Chlorite ClO_2^-	Peroxide O_2	
Hypochlorite ClO^-	Sulfate SO_4	
Cyanide CN^-	Sulfite SO_3	
Thiocyanate SCN^-		
Hydrogen carbonate HCO_3^-		
Hydroxide OH^-		
Hypochlorite ClO^-		
Iodate IO_3^-		
Nitrate NO_3^-		
Nitrite NO_2^-		
Permanganate MnO_4^-		

Hints for oxyanions—polyatomic ions containing oxygen:

- Names end in –ate or –ite
    - –ate is used for most common form
    - –ite is used for the form with the same charge, but one less oxygen
    - Examples:
        - NO3- = nitrate
        - NO2- = nitrite
- Prefixes are also used
    - Per- indicates ore more oxygen than –ate (think “perfect = overachieving”)
    - Hypo- indicates one fewer oxygen than –ite
    - Examples:
        - ClO4- = perchlorate
        - ClO3- = chlorate
        - ClO2- = chlorite
        - ClO- = hypochlorite
- Fluorine, chlorine, bromine, and iodine all behave the same
    - If ClO3- is chlorate, then BrO3- is bromate
    - Learn the chlorate series and you’ll automatically know bromate, iodate, and fluorate

Other polyatomic hints:

- Hydrogen (H+) can be added to -2 or -3 ions to make a “new ion”
    - CO32- = carbonate and HCO3- = hydrogen carbonate
    - HPO42- = hydrogen phosphate
    - H2PO4- = dihydrogen phosphate