

### Polyatomic Ions To Memorize

|                        |                                  |                                    |  |
|------------------------|----------------------------------|------------------------------------|--|
| $\text{NH}_4^+$        | ammonium                         | $\text{NO}_2^-$                    | nitrite  |
| $\text{H}_3\text{O}^+$ | hydronium                        | $\text{SO}_3^{2-}$                 | sulfite  |
| $\text{Hg}_2^{2+}$     | mercurous ion / mercury(I) ion   | $\text{PO}_3^{3-}$                 | phosphite  |
| $\text{OH}^-$          | hydroxide                        | $\text{ClO}_2^-$                   | chlorite   |
| $\text{O}_2^{2-}$      | peroxide                         | $\text{ClO}^-$                     | hypochlorite   |
| $\text{CN}^-$          | cyanide                          | $\text{ClO}_4^-$                   | perchlorate  |
| $\text{NO}_3^-$        | nitrate                          | $\text{OCN}^-$                     | cyanate  |
| $\text{ClO}_3^-$       | chlorate                         | $\text{MnO}_4^-$                   | permanganate   |
| $\text{BrO}_3^-$       | bromate                          | $\text{C}_2\text{H}_3\text{O}_2^-$ | acetate (also $\text{OAc}^-$ or $\text{CH}_3\text{CO}_2^-$ ) |
| $\text{IO}_3^-$        | iodate                           | $\text{C}_2\text{O}_4^{2-}$        | oxalate  |
| $\text{SO}_4^{2-}$     | sulfate                          | $\text{CrO}_4^{2-}$                | chromate   |
| $\text{CO}_3^{2-}$     | carbonate                        | $\text{Cr}_2\text{O}_7^{2-}$       | dichromate   |
| $\text{HCO}_3^-$       | hydrogen carbonate (bicarbonate) |                                    |  |
| $\text{PO}_4^{3-}$     | phosphate                        |                                    |  |

### Stock System for ions with more than one possible charge:

|           |                  |                    |          |                    |                   |
|-----------|------------------|--------------------|----------|--------------------|-------------------|
| chromium  | $\text{Cr}^{2+}$ | chromium(II) ion   | mercury  | $\text{Hg}_2^{2+}$ | mercury(I) ion    |
|           | $\text{Cr}^{3+}$ | chromium(III) ion  |          | $\text{Hg}^{2+}$   | mercury(II) ion   |
| manganese | $\text{Mn}^{2+}$ | manganese(II) ion  | tin      | $\text{Sn}^{2+}$   | tin(II) ion       |
|           | $\text{Mn}^{3+}$ | manganese(III) ion |          | $\text{Sn}^{4+}$   | tin(IV) ion       |
| iron      | $\text{Fe}^{2+}$ | iron(II) ion       | lead     | $\text{Pb}^{2+}$   | lead(II) ion      |
|           | $\text{Fe}^{3+}$ | iron(III) ion      |          | $\text{Pb}^{4+}$   | lead(IV) ion      |
| cobalt    | $\text{Co}^{2+}$ | cobalt(II) ion     | antimony | $\text{Sb}^{3+}$   | antimony(III) ion |
|           | $\text{Co}^{3+}$ | cobalt(III) ion    |          | $\text{Sb}^{5+}$   | antimony(V) ion   |
| copper    | $\text{Cu}^+$    | copper(I) ion      | bismuth  | $\text{Bi}^{3+}$   | bismuth(III) ion  |
|           | $\text{Cu}^{2+}$ | copper(II) ion     |          | $\text{Bi}^{5+}$   | bismuth(V) ion    |

### Metric prefixes:

| Factor     | Prefix | Symbol | Example                       | Example                             |
|------------|--------|--------|-------------------------------|-------------------------------------|
| $10^9$     | giga   | G      | 1 Gm = $1 \times 10^9$ m      |                                     |
| $10^6$     | mega   | M      | 1 Mm = $1 \times 10^6$ m      |                                     |
| $10^3$     | kilo   | k      | 1 km = 1000 m                 |                                     |
| $10^{-1}$  | deci   | d      | 1 dm = 0.1 m                  | 1 m = 10 dm                         |
| $10^{-2}$  | centi  | c      | 1 cm = 0.01 m                 | 1 m = 100 cm                        |
| $10^{-3}$  | milli  | m      | 1 mm = 0.001 m                | 1 m = 1000 mm                       |
| $10^{-6}$  | micro  | $\mu$  | 1 $\mu\text{m}$ = $10^{-6}$ m | 1 m = $1 \times 10^6$ $\mu\text{m}$ |
| $10^{-9}$  | nano   | n      | 1 nm = $10^{-9}$ m            | 1 m = $1 \times 10^9$ nm            |
| $10^{-12}$ | pico   | p      | 1 pm = $10^{-12}$ m           | 1 m = $1 \times 10^{12}$ pm         |

**Diatomic Elements:**  $\text{H}_2$ ,  $\text{N}_2$ ,  $\text{O}_2$ ,  $\text{F}_2$ ,  $\text{Cl}_2$ ,  $\text{Br}_2$ ,  $\text{I}_2$

**Avogadro's Number:**  $N_A = 6.022 \times 10^{23}$  things/mole

