# Chemistry 22 Memorization List

## Need to Know (MEMORIZE)

### Memory Quiz #1 - SI Conversions

**T=tera, $10^{12}$**

**G=giga, $10^{9}$**

**M=mega, $10^{6}$**

**k=kilo, $10^{3}$**

**h=hecto, $10^{2}$**

**da=deka, $10^{1}$**

**p=pico, $10^{-12}$**

**n=nano, $10^{-9}$**

**μ=micro, $10^{-6}$**

**m=milli, $10^{-3}$**

**c=centi, $10^{-2}$**

**d=deci, $10^{-1}$**

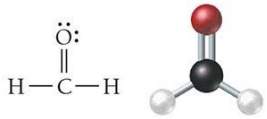
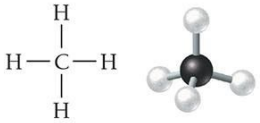
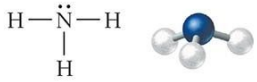
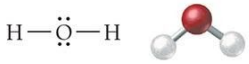
**1 $cm^3$ = 1 mL**

### Memory Quiz #2 - Names and Symbols

H - hydrogen
He - helium
Li - lithium
Be - beryllium
B - boron
C - carbon
N - nitrogen
O - oxygen
**F - fluorine**
Ne - neon
**Na - sodium**
Mg - magnesium
Al - aluminum
Si - silicon
P - phosphorus
S - sulfur
Cl - chlorine
Ar - argon
**K - potassium**
Ca - calcium
Sc - scandium
Ti - titanium
V - vanadium
Cr - chromium
Mn - manganese
**Fe - iron**
Co - cobalt
Ni - nickel
Cu - copper
Zn - zinc
Ga - gallium
Ge - germanium
As - arsenic
Se - selenium
Br - bromine
Kr - krypton
Rb - rubidium
Sr - strontium
**Ag - silver**
Cd - cadmium
**Sn - tin**
**Sb - antimony**
Te - tellurium
I - iodine
Xe - xenon
Cs - cesium
Ba - barium
**Au - gold**
**Hg - mercury**
**Pb - lead**
Rn - radon
Fr - francium
Ra - radium
U - uranium

## Memory Quiz #3 -

VSEPR Theory - Valence Shell Electron Pair Repulsion Theory:

| Electron Groups* | Bonding Groups | Lone Pairs | Electron Geometry | Angle between Electron Groups** | Molecular Geometry | Example |
|---|---|---|---|---|---|---|
| 2 | 2 | 0 | linear | 180° | linear |  |
| 3 | 3 | 0 | trigonal planar | 120° | trigonal planar |  |
| 3 | 2 | 1 | trigonal planar | 120° | bent |  |
| 4 | 4 | 0 | tetrahedral | 109.5° | tetrahedral |  |
| 4 | 3 | 1 | tetrahedral | 109.5° | trigonal pyramidal |  |
| 4 | 2 | 2 | tetrahedral | 109.5° | bent |  |

## Memory Quiz #4 - Common Polyatomic Ions

| | | | |
|---|---|---|---|
| $OH^{1-}$ | Hydroxide | $O_2^{2-}$ | Peroxide |
| $CN^{1-}$ | Cyanide | $CO_3^{2-}$ | Carbonate |
| $SCN^{1-}$ | Thiocyanate | $SO_3^{2-}$ | Sulf*ite* |
| $HCO_3^{1-}$ | Hydrogen Carbonate (Bicarbonate) | $SO_4^{2-}$ | Sulf*ate* |
| $HSO_3^{1-}$ | Hydrogen Sulf*ite* (Bisulf*ite*) | $S_2O_3^{2-}$ | Thiosulfate |
| $HSO_4^{1-}$ | Hydrogen Sulf*ate* (Bisulf*ate*) | $C_2O_4^{2-}$ | Oxalate |
| $C_2H_3O_2^{1-}$ or $CH_3COO^{1-}$ | Acetate | $CrO_4^{2-}$ | Chromate |
| $NO_2^{1-}$ | Nitr*ite* | $Cr_2O_7^{2-}$ | *Di*chromate |
| $NO_3^{1-}$ | Nitr*ate* | $PO_3^{3-}$ | Phosph*ite* |
| $MnO_4^{1-}$ | Permanganate | $PO_4^{3-}$ | Phosph*ate* |
| $ClO^{1-}$ | *Hypo*chlor*ite* | $ClO_4^{1-}$ | *Per*chlor*ate* |
| $ClO_2^{1-}$ | Chlor*ite* | $NH_4^{1+}$ | Ammonium |
| $ClO_3^{1-}$ | Chlor*ate* | $Hg_2^{2+}$ | Mercury (I) |

## Memory Quiz #5 -- Acids and Bases

| **Strong Acids** | | | **Strong Bases** | |
|---|---|---|---|---|
| $HCl_{(aq)}$ | $H_2SO_{4(aq)}$ | | $LiOH$ | $Ca(OH)_2$ |
| $HBr_{(aq)}$ | $HNO_{3(aq)}$ | | $KOH$ | $Sr(OH)_2$ |
| $HI_{(aq)}$ | $HClO_{4(aq)}$ | | $NaOH$ | $Ba(OH)_2$ |

*All other acids/bases are weak.

**$NH_3$ (ammonia), $HCO_3^-$ (bicarbonate ion), are weak bases.

***$H_3O^+ = H^+$ , when in water