MIMIN-SAVADI

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Shit to Memorise

CHEM 1035

Polyatomic Ions

CATIONS

NH_4^+ Ammonium

Hg_2^{2+} Mercury(I)

Anions (that ends in -ide)

CN^- Cyanide

OH^- Hydroxide

O_2^{2-} Peroxide

Oxoanions

1-charge		2-charge		3-charge	
$C_2H_3O_2^-$	Acetate	CO_3^{2-}	Carbonate	PO_4^{3-}	Phosphate
NO_2^-	Nitrite	$C_2O_4^{2-}$	Oxalate	PO_3^{3-}	Phosphite
NO_3^-	Nitrate	CrO_4^{2-}	Chromate		
MnO_4^-	Permanganate	$Cr_2O_7^{2-}$	Dichromate		
ClO^-	Hypochlorite	SO_3^{2-}	Sulfite		
ClO_2^-	Chlorite	SO_4^{2-}	Sulfate		
ClO_3^-	Chlorate				
ClO_4^-	Perchlorate				

Oxidation Rules

① Atom in elemental form → O.N. = 0

② Monatomic Ion → O.N. = Ion Charge

③ Sum of O.N.'s in formula unit or molecule = 0

④ Sum of O.N.'s in Polyatomic Ion = 0

⑤ Group 1A(1) → O.N. = +1 in all compounds

⑥ Group 2A(2) → O.N. = +2 in all compounds

⑦ Hydrogen → O.N. = +1 in combination with non-metals ★ 98% of all problems

↳ O.N. = -1 in combination with metals & boron

⑧ Flourine → O.N. = -1 in all compounds

⑨ Oxygen → O.N. = -1 in peroxides

↳ O.N. = -2 in all other compounds (except w/ F) ★ 98% of all problems

⑩ Group 7A(17) → O.N. = -1 in combination with metals, non-metals (except O), and other halogens lower in the group

ACIDS

STRONG ACIDS

① Hydrochloric Acid ; HCl
② Hydrobromic Acid ; HBr
③ Hydriodic Acid ; HI
④ Nitric Acid ; HNO_3
⑤ Sulfuric Acid ; H_2SO_4
⑥ Perchloric Acid ; $HClO_4$

STRONG BASES LIST

① Group 1A(1) Hydroxides
→ Lithium Hydroxide ; LiOH
→ Sodium Hydroxide ; NaOH
→ Potassium Hydroxide ; KOH
→ Rubidium Hydroxide ; CaOH
→ Cesium Hydroxide ; CsOH

② Heavy Group 2A(2) Hydroxides
→ Calcium Hydroxide ; $Ca(OH)_2$
→ Strontium Hydroxide ; $Sr(OH)_2$
→ Barium Hydroxide ; $Ba(OH)_2$

Acid-Base Reactions

	Net Ionic Equation (General)
• Strong Acid + Strong Base → Salt + Water	$H^+(aq) + OH^-(aq) \rightarrow H_2O(l)$
• Weak Acid + Strong Base → Salt + Water	$HA(aq) + OH^-(aq) \rightarrow A^-(aq) + H_2O$
• Strong Acid + Weak Base → Salt	$H^+(aq) + B \rightarrow BH^+$

Naming Acids

Ⓐ BINARY ACID : H + non-metal element (eg. HCl)

Hydro + non-metal root + "ic" + "acid"

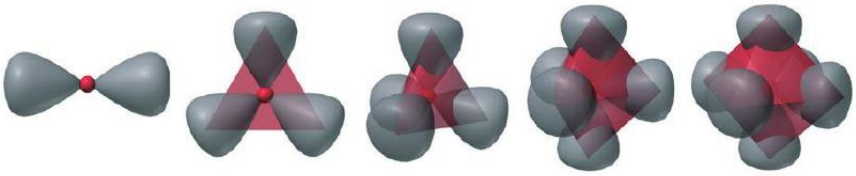
eg. HF : Hydro + Flour + ic + Acid ; H_2S : Hydro + sulfur + ic + acid

Ⓑ OXOACID : H + O + non-metal element

① "-ate" changed to -ic acid
② "-ite" changed to -ous acid

eg:- $HClO$ → ClO^- = hypochlorite → Hypochlorous acid
$HClO_4$ → ClO_4^- = perchlorate → Perchloric acid

Table 11.1 Composition and Orientation of Hybrid Orbitals

	Linear	Trigonal Planar	Tetrahedral	Trigonal Bipyramidal	Octahedral
Atomic orbitals mixed	one *s* one *p*	one *s* two *p*	one *s* three *p*	one *s* three *p* one *d*	one *s* three *p* two *d*
Hybrid orbitals formed	two *sp*	three sp^2	four sp^3	five sp^3d	six sp^3d^2
Unhybridized orbitals remaining	two *p*	one *p*	none	four *d*	three *d*
Orientation					

Hybridization is determined by the # of electron groups around the central atom:

- **2 electron groups**: **sp hybridization** (2 orbitals) AX_2
- **3 electron groups**: **sp^2 hybridization** (3 orbitals) AX_3 AX_2E
- **4 electron groups**: **sp^3 hybridized** (4 orbitals) AX_4 AX_3E AX_2E_2
- **5 electron groups**: **sp^3d hybridized** (5 orbitals)
- **6 electron groups**: **sp^3d^2 hybridized** (6 orbitals)