6 Strong Acids		6 Strong Bases	
$HClO_4$	perchloric acid	LiOH	lithium hydroxide
HCl	hydrochloric acid	NaOH	sodium hydroxide
HBr	hydrobromic acid	KOH	potassium hydroxide
HI	hydroiodic acid	$Ca(OH)_2$	calcium hydroxide
HNO_3	nitric acid	$Sr(OH)_2$	strontium hydroxide
H_2SO_4	sulfuric acid	$Ba(OH)_2$	barium hydroxide

Reminder: ions, ionic bond, proton

strong acid:

$$HCl + H_2O \longrightarrow H^+ + Cl^-$$

weak acid:

$$CH_3COOH + H_2O \rightleftharpoons CH_3COO^- + H^+$$

strong base:

$$NaOH + H_2O \longrightarrow Na^+ + OH^-$$

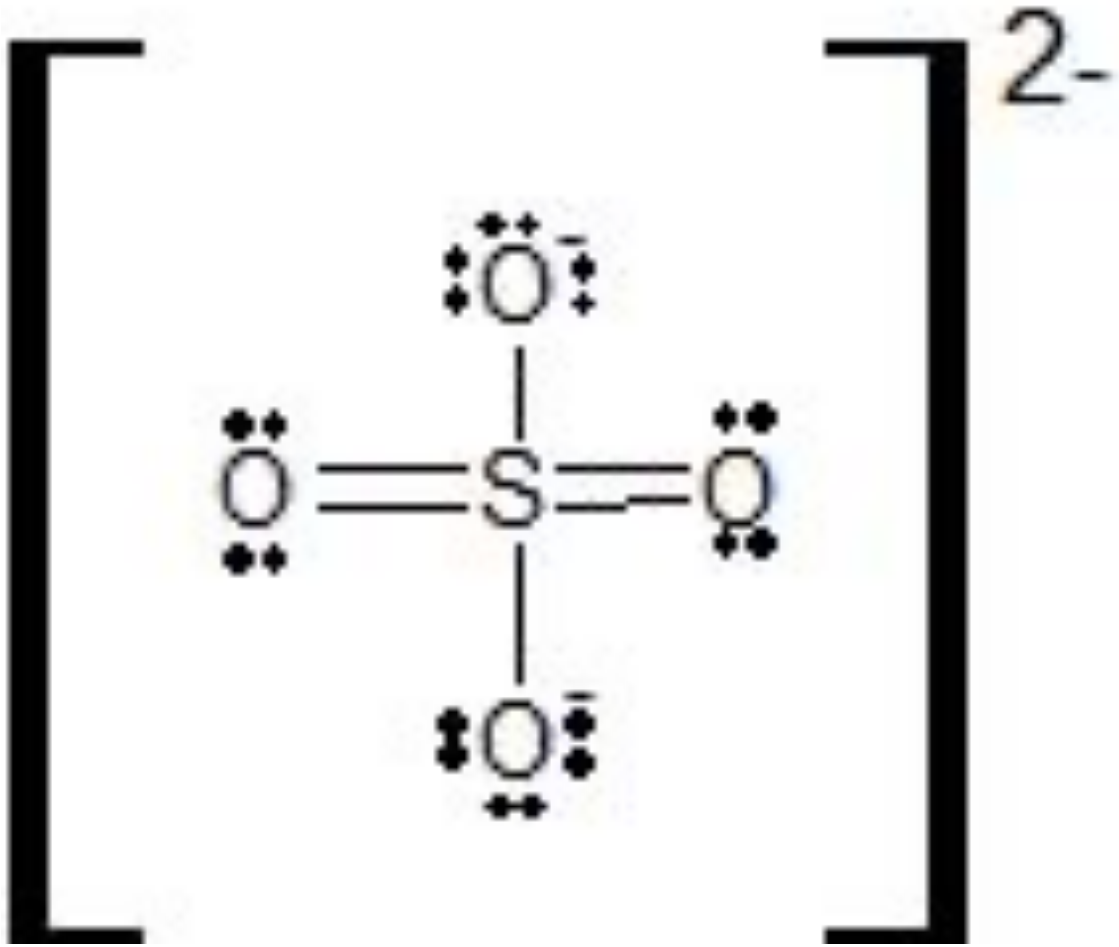
weak base:

$$NH_3 + H_2O \rightleftharpoons NH_4^+ + OH^-$$

Polyatomic ions

SO_4^{2-} NO_3^-

Sulfate ion.
When sulfuric acid H_2SO_4 gives away the proton, the sulfate ion is formed. For a dilute solutions we can write the following (simplified) equation.

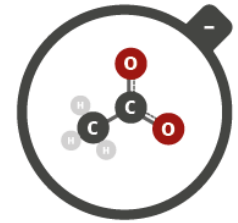


$H_2SO_4 + H_2O \rightarrow H^+ + SO_4^{2-}$

$H^+ + H_2O \rightarrow H_3O^+$ (hydronium ion)

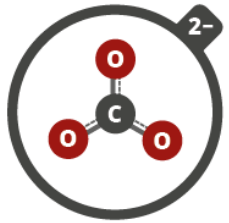
POLYATOMIC IONS: NAMES, FORMULAE & CHARGES

A polyatomic ion is a charged species consisting of two or more atoms covalently bonded together. Here's a guide to some of the most common examples!



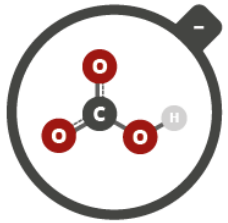
ACETATE

Formula: $C_2H_3O_2^-$



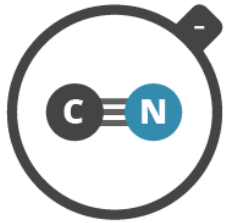
CARBONATE

Formula: CO_3^{2-}



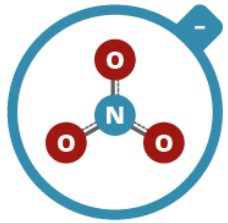
HYDROGEN CARBONATE

Formula: HCO_3^-



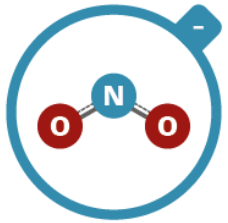
CYANIDE

Formula: CN^-



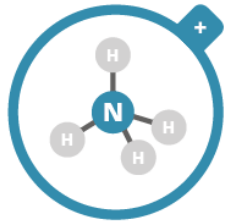
NITRATE

Formula: NO_3^-



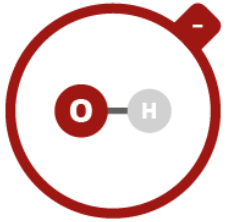
NITRITE

Formula: NO_2^-



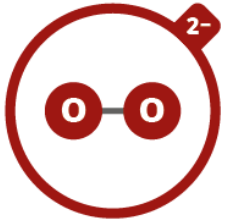
AMMONIUM

Formula: NH_4^+



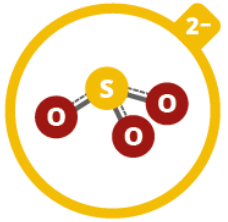
HYDROXIDE

Formula: OH^-



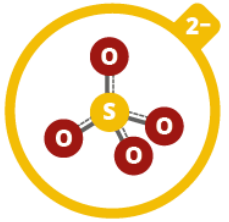
PEROXIDE

Formula: O_2^{2-}



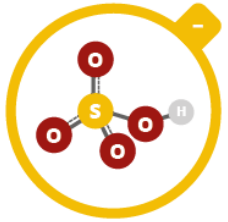
SULFITE

Formula: SO_3^{2-}



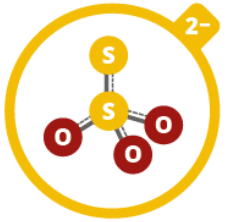
SULFATE

Formula: SO_4^{2-}



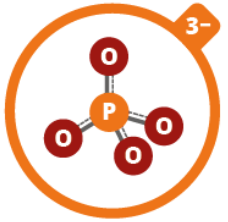
HYDROGEN SULFATE

Formula: HSO_4^-



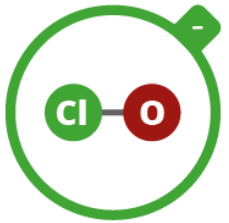
THIOSULFATE

Formula: $S_2O_3^{2-}$



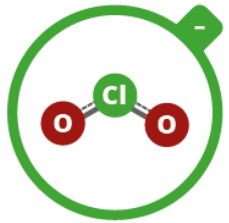
PHOSPHATE

Formula: PO_4^{3-}



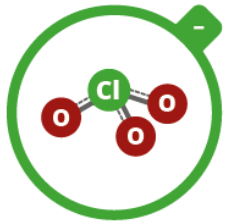
HYPOCHLORITE

Formula: ClO^-



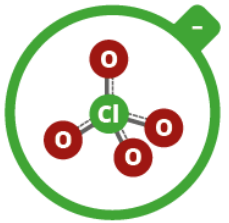
CHLORITE

Formula: ClO_2^-



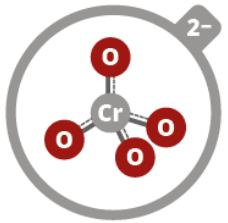
CHLORATE

Formula: ClO_3^-



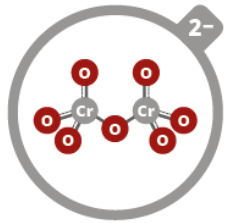
PERCHLORATE

Formula: ClO_4^-



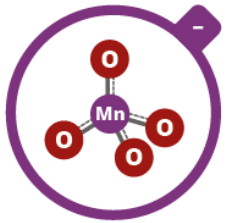
CHROMATE

Formula: CrO_4^{2-}



DICHROMATE

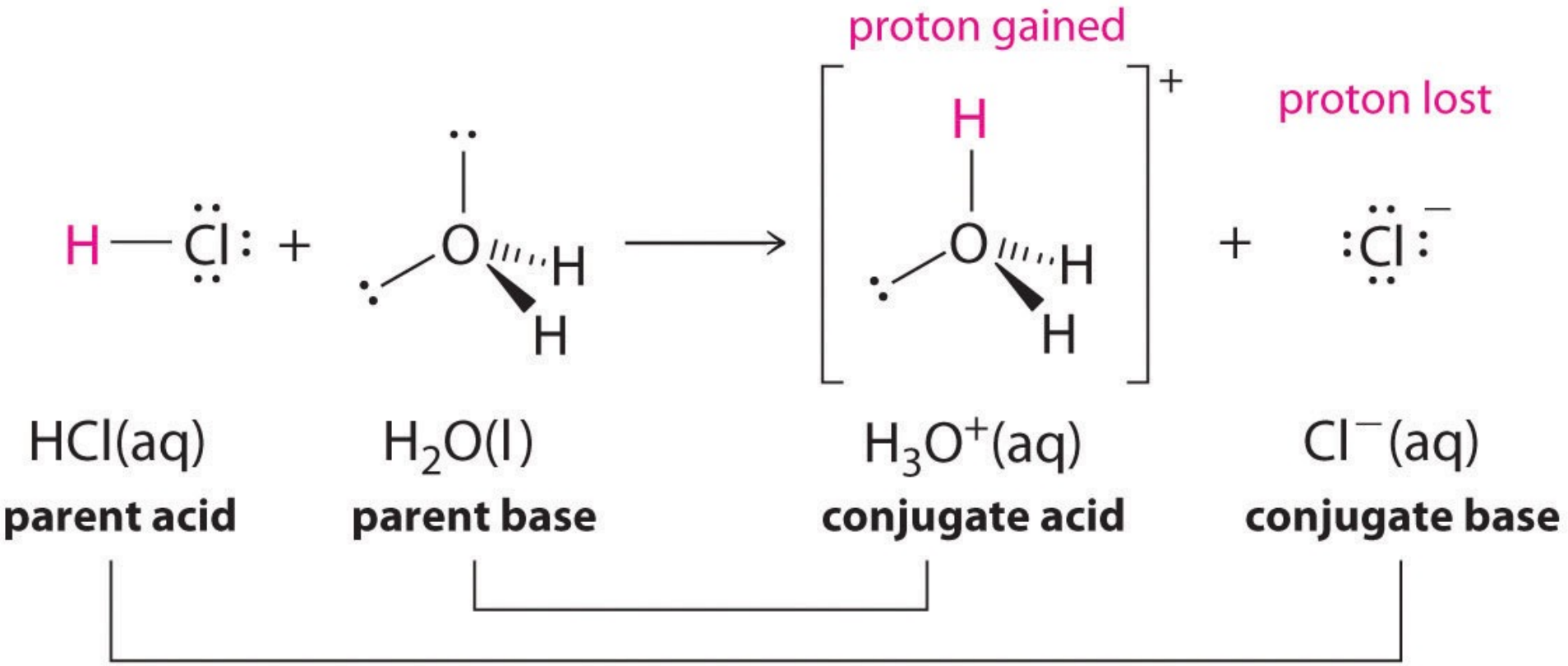
Formula: $Cr_2O_7^{2-}$



PERMANGANATE

Formula: MnO_4^-

conjugate acid base pairs



Dissociation of water

$H_2O \rightarrow H^+ + OH^-$

In pure water the concentration of H^+ and OH^- is equal at 10^{-7} mol/L, pH 7.

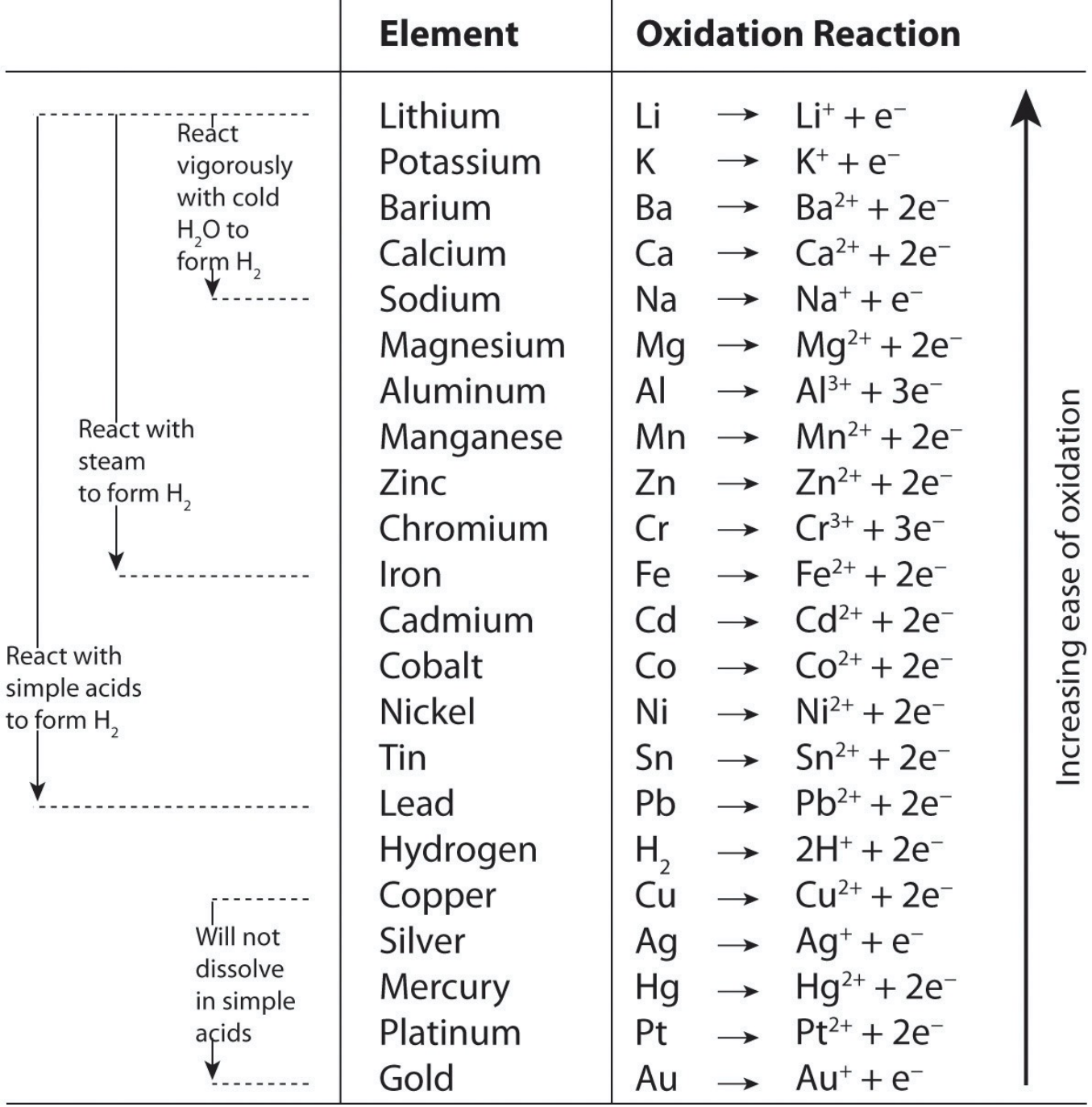
losing proton

HA  A^-

gaining proton

Some conjugate acid base pairs:

Acids, strongest to weakest	Bases, weakest to strongest
H_2SO_4	HSO_4^-
HI	I^-
HBr	Br^-
HCl	Cl^-
HNO_3	NO_3^-
H_3PO_4	$H_2PO_4^-$
NH_4^+	NH_3
H_2O	OH^-



https://youtu.be/OBdgeJFzSec

Solubility table

	Bromide Br^-	Carbonate CO_3^{2-}	Chloride Cl^-	Chlorates ClO_3^-	Hydroxide OH^-	Nitrate NO_3^-	Oxide O^{2-}	Phosphate PO_4^{3-}	Sulfate SO_4^{2-}	Dichromate $Cr_2O_7^{2-}$
Aluminium Al^{3+}	S	X	S	S	I	S	I	I	S	I
Ammonium NH_4^+	S	S	S	S	S	S	X	S	S	S
Calcium Ca^{2+}	S	I	S	S	sS	S	sS	I	sS	I
Copper(II) Cu^{2+}	S	I	S	S	I	S	I	I	S	I
Iron(II) Fe^{2+}	S	I	S	S	I	S	I	I	S	I
Iron(III) Fe^{3+}	S	X	S	S	I	S	I	I	sS	I
Magnesium Mg^{2+}	S	I	S	S	I	S	I	I	S	I
Potassium K^+	S	S	S	S	S	S	S	S	S	S
Silver Ag^+	I	I	I	S	X	S	I	I	sS	I
Sodium Na^+	S	S	S	S	S	S	S	S	S	S
Zinc Zn^{2+}	S	I	S	S	I	S	I	I	S	I
	Bromide Br^-	Carbonate CO_3^{2-}	Chloride Cl^-	Chlorates ClO_3^-	Hydroxide OH^-	Nitrate NO_3^-	Oxide O^{2-}	Phosphate PO_4^{3-}	Sulfate SO_4^{2-}	Dichromate $Cr_2O_7^{2-}$