Polyatomic Ions to Memorize

AP Chemistry · 31 cards

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TERM	DEFINITION
Ammonium	NH_4^+ The most common polyatomic cation.
Hydronium	H_3O^+ A water molecule that has gained H^+; present in every acidic solution.
Mercury(I) ion	Hg_2^{2+} Two bonded Hg atoms: mercury(I) chloride is Hg_2Cl_2, not HgCl.
Hydroxide	OH^- The ion that makes a solution basic.
Cyanide	CN^- Carbon and nitrogen only, no oxygen.
Thiocyanate	SCN^- Cyanate OCN^- with its O replaced by S.
Acetate	CH_3COO^-, also written $C_2H_3O_2^-$ Follows no -ate/-ite pattern: learn it on its own.
Nitrate	NO_3^- Nitrite has one O fewer, with the same 1− charge.
Nitrite	NO_2^- The -ite form: one O fewer than nitrate.
Hypochlorite	ClO^- The active ion in household bleach; one O fewer than chlorite.

TERM	DEFINITION
Chlorite	ClO_2^- One O more than hypochlorite, one fewer than chlorate.
Chlorate	ClO_3^- The reference -ate of the chlorine family.
Perchlorate	ClO_4^- per-: one O more than chlorate, same charge.
Bromate	BrO_3^- Same pattern as chlorate, with bromine.
Iodate	IO_3^- Same pattern as chlorate, with iodine.
Permanganate	MnO_4^- Deep purple oxidizing agent of redox titrations; same O count as manganate MnO_4^{2-}, so per- here does not add an O.
Hydrogen carbonate (bicarbonate)	HCO_3^- Carbonate plus H^+: the charge goes from 2− to 1−.
Hydrogen sulfate (bisulfate)	HSO_4^- Sulfate plus H^+: charge 1−.
Hydrogen sulfite (bisulfite)	HSO_3^- Sulfite plus H^+: charge 1−.
Dihydrogen phosphate	$H_2PO_4^-$ Phosphate plus two H^+: the charge goes from 3− to 1−.
Carbonate	CO_3^{2-} Releases CO_2 gas when it reacts with an acid.
Sulfate	SO_4^{2-} Sulfite has one O fewer, with the same 2− charge.

TERM	DEFINITION
Sulfite	SO_3^{2-} The -ite form: one O fewer than sulfate.
Thiosulfate	$S_2O_3^{2-}$ Sulfate with one O replaced by S.
Chromate	CrO_4^{2-} Yellow in solution; same shape of formula as sulfate.
Dichromate	$Cr_2O_7^{2-}$ Orange; two Cr atoms but still a 2− charge.
Oxalate	$C_2O_4^{2-}$ Two carbons; comes from oxalic acid, $H_2C_2O_4$.
Peroxide	O_2^{2-} Two bonded O atoms: hydrogen peroxide is H_2O_2.
Hydrogen phosphate	HPO_4^{2-} Phosphate plus one H^+: charge 2−.
Phosphate	PO_4^{3-} The main 3− ion; phosphite has one O fewer.
Phosphite	PO_3^{3-} Formula used in course lists; in solution, the real phosphite ion is HPO_3^{2-}.