CATIONS			Common lons	5		The section of
ammonium NH4* cadmium(II) Cd²* chromium(III) Cr²* chromium(III) Cr³* chromium(III) Cr³* chromium(III) Cr³* chromium(III) Cr³* chromium(III) Cr²* chromium(IIII) Cr²* chromium(IIII) Cr²* chromium(IIII) Cr²* chromium(IIII) Fe³* chromium(IIIII) Fe³* chromium(IIII) Fe³* chromium(IIII) Fe³* chromium(IIII) Fe³* chromium(IIIII) Fe³* chromium(IIIIIIIII) Fe³* chromium(IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		CATIONS				
copper(I) (green) Cu' chromium(II) Cr² in chromium (III) Cr² in chromium (III) Fe³ in confull hydronium H30° copper(I) (blue) Co²* lead(III) iron(III) Fe³ in confulIII Pb³* in confulIII Pb³* in confulIII Pb³* in confulIII Pb³* in confulIII Ni³*	+1		+2		+3	
Nydronium	ammonium	NH ₄ ⁺	cadmium(II)	Cd^{2+}	cobalt(III) (blue)	Co ³⁺
silver Ag* cobalt(II) (blue) Co²* lead(III) Pb³* iron(II) Fe²* nickel(III) Ni³* lead(II) Pb²* vanadium(III) V³* mercury(I) Hg²* vanadium(III) V³* +4 nickel(II) (green) Ni²* +7 manganese(II) Mn²* tin(I) Sn³* tin(II) Sn²* manganese(VII) Mn²* vanadium(II) V³* vanadium(II) V²* wanadium(II) V²* yanadium(II) V²* wanadium(II) V²* yanadium(II) V²* wanadium(II) V²* yanadium(II) Y²* <td></td> <td>Cu^+</td> <td>chromium(II)</td> <td>Cr²⁺</td> <td>chromium (III)</td> <td></td>		Cu^+	chromium(II)	Cr ²⁺	chromium (III)	
iron(II) Fe ^{2**} nickel(III) Ni ^{3**} lead(II) Pb ^{3**} vanadium(III) V ^{3**} mercury(I) Hg ^{2**} mercury(II) Hg ^{2**} mercury(II) Hg ^{2**} manganese(II) Mn ^{2**} tin(II') Sn ^{4**} tin(II) Sn ^{2**} manganese(III) Mn ^{7**} lead(II') Pb ^{4**} vanadium(II') V ^{2**} vanadium(II') V ^{3**} vanadium(III') V ^{3**} vanadium(III') vanadium(II') vanadium(III') vanadium(II') vanadium(I						
lead(II)	silver	Ag^{+}	cobalt(II) (blue)		lead(III)	
mercury(I) Hg2^2 mercury(II) Hg2 mercury(II) Mn2 mickel(II) (green) Ni2 Ni2 +7 mickel(II) (green) Ni2			iron(II)		nickel(III)	
manganese(II) Mn²²					vanadium(III)	V.3+
manganese(II) Mn²²				Hg ₂ ²⁺		
Tin(II)				Hg ⁻		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $						
$ \begin{array}{ c c c c } \hline lead(II) & Pb^{4^+} & vanadium(II) & V^{2^+} \\ \hline vanadium(II) & V^{4^+} & zinc & Zn^{2^+} \\ \hline \hline & ANIONS & & & & & & & & & & & & & & & & & & &$		Cn4+				Mn ⁷⁺
vanadium(II) V4" zinc Zn2" ANIONS 1- 2- 3- acetate CH ₃ COO carbonate CO ₃ ²⁻² phosphite PO ₃ ³⁻¹ hypobromite BrO_ chromate (yellow) CrO ₄ ²⁻² phosphate PO ₄ ³⁻¹ bromate BrO ₃ chromate (yellow) CrO ₄ ²⁻² phosphate PO ₄ ³⁻¹ bromate BrO ₃ chromate (orange) Cr ₂ O ₇ ²⁻² hydrogen phosphate HPO ₄ colspan="2">HPO ₄ colspan="2">HPO ₄ colspan="2">Peroxide O ₂ colspan="2">Cr ₂ O ₇ ²⁻² cyanide CN sulfite SO ₂ colspan="2">SO ₂					manganese(VII)	IVIII
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	variacium(17)	ANIONS	ZIIIC	211		
acetate CH_3COO $C_2H_3O_2^{-1}$ carbonate $CO_3^{2^+}$ phosphite $CO_3^{3^+}$ phypobromite $CO_3^{3^+}$ chromate (yellow) $CCO_4^{3^+}$ phosphate $CCO_4^{3^+}$ phosphate $CCO_4^{3^+}$ phosphate $CCO_4^{3^+}$ phosphate $CCO_4^{3^+}$ promite $CCO_4^{3^+}$ phosphate $CCO_4^{3^+}$ promate $CCO_4^{3^+}$ promate $CCO_4^{3^+}$ promate $CCO_4^{3^+}$ proposed $CCOO_4^{3^+}$ proposed $CCOO_4^{3^+$	1	ANIONS	•		2	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$		CH COO-		CO 2-		PO 3-
hypobromite BrO chromate (yellow) CrO4 phosphate PO4 arsenate BrO5 arsenate BrO4 arsenate BrO4 arsenate BrO6 perbromate BrO4 phypochlorite ClO dichromate (orange) Cr207 chlorite ClO2 hydrogen phosphate HPO42 perchlorate ClO3 oxalate C2042 perchlorate ClO4 perchlorate ClO4 perchlorate SO3 oxalate SO32 dihydrogen phosphate H2PO4 sulfate SO32 dihydrogen phosphate H2PO4 sulfate SO32 hydrogen sulfate HCO3 (bisulfate) hydrogen sulfate HSO3 (bisulfate) bisulfide HSO4 (bisulfate) sulfate SO3 isulfate SO36 dihydrogen sulfate HSO3 (bisulfate) hydrogen sulfate HSO4 (bisulfate) hydrogen sulfate HSO4 (bisulfate) sulfate SO4 (bisulfate) hydrogen sulfate HSO4 (bisulfate) sulfate SO4 (bisulfate) hydrogen sulfate HSO4 (bisulfate) sulfate SO4 (bisulfate) sulfate SO5 (bisulfate) sul	acetate		Carbonate	CO_3	phospinie	PO ₃
bromite BrO2 arsenate AsO43 bromate BrO3 bromate BrO4 hypochlorite ClO dichromate (orange) Cr2O72 chlorite ClO2 hydrogen phosphate HPO42 chlorate ClO3 oxalate C2O42 perchlorate ClO4 peroxide O2 cyanide CN sulfite SO32 dihydrogen phosphate H2PO4 sulfate SO42 formate HCOO thiosulfate S2O3 hydrogen carbonate (bicarbonate) hydrogen sulfite HSO3 (bisulfate) bisulfide HS hydroxide OH nitrite NO2 nitrate NO3 hypoiodite IO nitrate NO3 hypoiodite IO nitrate IO iodate IO3 nitrate IO4 periodate IO4 nitrate IO4 periodate IO4 nitrate IO4 nervanda Cr2O72 nitrate IO4 nervanda AsO43 nervanda AsO43 nervanda Cr2O72 nerva	hypohromite		chromate (vellow)	CrO.2-	nhoenhate	PO 3-
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			cinomate (yenow)	C1O ₄		
hypochlorite					arschate	A3O4
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$						
chlorite ClO_2^- hydrogen phosphate HPO_4^{2-} chlorate ClO_3^- oxalate $C_2O_4^{2-}$ perchlorate ClO_4^- peroxide O_2^{2-} cyanide CN^- sulfite SO_3^{2-} dihydrogen phosphate $H_2PO_4^-$ sulfate SO_4^{2-} formate $HCOO^-$ thiosulfate $S_2O_3^{2-}$ hydrogen carbonate HCO_3^- (bicarbonate) hydrogen sulfite HSO_3^- (bisulfite) hydrogen sulfate HSO_4^- (bisulfate) bisulfide HS^- hydroxide OH^- nitrate NO_2^- nitrate NO_3^- hypoiodite IO^- iodate IO_2^- iodate IO_4^-			dichromate (orange)	Cr.O-2-		
chlorate ClO_3 oxalate $C_2O_4^{2-}$ perchlorate ClO_4 peroxide O_2^{2-} cyanide CN^- sulfite SO_3^{2-} dihydrogen phosphate $H_2PO_4^-$ sulfate SO_4^{2-} formate $HCOO^-$ thiosulfate $S_2O_3^{2-}$ hydrogen carbonate HCO_3^- (bicarbonate) hydrogen sulfite HSO_3^- (bisulfite) hydrogen sulfate HSO_4^- (bisulfate) bisulfide HS^- hydroxide OH^- nitrate NO_2^- nitrate NO_3^- hypoiodite IO^- iodate IO_2^- iodate IO_4^-						
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dihydrogen phosphate $H_2PO_4^-$ sulfate $SO_4^{2^-}$ formate $HCOO^-$ thiosulfate $S_2O_3^{2^-}$ hydrogen carbonate (bicarbonate) HCO_3^- (bicarbonate) hydrogen sulfite (bisulfite) HSO_3^- (bisulfate) hydrogen sulfate (bisulfate) HS^- (bisulfide) hydroxide $OH^ OH^-$ nitrite $NO_2^ OH^-$ nitrate $NO_3^ OH^-$ hypoiodite $OH^ OH^-$ iodate $OH^ OH^-$ periodate $OH^ OH^-$						
formate HCOO thiosulfate S2O32 hydrogen carbonate (bicarbonate) hydrogen sulfite (bisulfite) hydrogen sulfate (bisulfate) bisulfide HSO4 hydroxide OH nitrite NO2 nitrate NO3 hypoiodite IO iodate IO3 periodate IO4 periodate IO5 periodate IO4 periodate IO5 periodate						
hydrogen carbonate (bicarbonate) hydrogen sulfite (bisulfite) hydrogen sulfate (bisulfate) hydrogen sulfate (bisulfate) bisulfide HS ⁻ hydroxide OH ⁻ nitrite NO ₂ ⁻ nitrate NO ₃ ⁻ hypoiodite IO ⁻ iodate IO ₃ ⁻ periodate IO ₄ ⁻						
(bicarbonate) hydrogen sulfite HSO ₃ ⁻ (bisulfite) hydrogen sulfate HSO ₄ ⁻ (bisulfate) bisulfide HS ⁻ hydroxide OH ⁻ nitrite NO ₂ ⁻ nitrate NO ₃ ⁻ hypoiodite IO ⁻ iodite IO ₂ ⁻ iodate IO ₃ ⁻ periodate IO ₄ ⁻			tinosunate	3203		
hydrogen sulfite (bisulfite) hydrogen sulfate (bisulfate) bisulfide HS^- hydroxide OH^- nitrite NO_2^- nitrate NO_3^- hypoiodite IO_2^- iodate IO_3^- periodate IO_4^-		11003				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	hydrogen sulfite	HSO ₃				
(bisulfate)bisulfide HS^- hydroxide OH^- nitrite NO_2^- nitrate NO_3^- hypoiodite IO^- iodite IO_2^- iodate IO_3^- periodate IO_4^-						
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		HSO ₄				
nitrite NO_2^- nitrate NO_3^- hypoiodite IO^- iodite IO_2^- iodate IO_3^- periodate IO_4^-		HS ⁻				
nitrate NO_3^- hypoiodite IO^- iodite IO_2^- iodate IO_3^- periodate IO_4^-	hydroxide	OH-	,			
nitrate NO_3^- hypoiodite IO^- iodite IO_2^- iodate IO_3^- periodate IO_4^-	nitrite	NO_2^-				
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	nitrate					
iodate IO_3^- periodate IO_4^-	hypoiodite	IO ⁻				
iodate IO_3^- periodate IO_4^-	iodite	IO_2^-				
periodate IO ₄	iodate					
· · · · · · · · · · · · · · · · · · ·	periodate					
permanganate (purple) wino4	permanganate (purple)					
thiocyanate SCN ⁻						

Memorization Quiz on this material STUFF I Need to Memorize in AP Chemistry

Solubility Rules of Common Ioni	ic Compounds in Water at 25°C	
Soluble Compounds	Exceptions	
alkali metals (H ⁺ , Li ⁺ , Na ⁺ , K ⁺ , Rb ⁺ , Cs ⁺) ammonium ion (NH ₄ ⁺)		
nitrates (NO ₃ ⁻), bicarbonates (HCO ₃ ⁻), chlorates (ClO ₃ ⁻), perchlorates (ClO ₄ ⁻), acetates (CH ₃ COO ⁻)		
halides (Cl ⁻ , Br ⁻ , l ⁻) fluorine ion (F ⁻)	Ag ⁺ , Hg ₂ ²⁺ and Pb ²⁺ (APH) Pb ²⁺ , Ca ²⁺ , Sr ²⁺ , Ba ²⁺ and Mg ²⁺ (CBS/PM)	
sulfates (SO ₄ ²⁻)	Ag ⁺ , Hg ₂ ²⁺ , Pb ²⁺ , Ca ²⁺ , Sr ²⁺ and Ba ²⁺ (CBS/APH)	
Insoluble Compounds	Exceptions	
carbonates (CO_3^{2-}), chromates (CrO_4^{2-}), oxalate ($C_2O_4^{2-}$), sulfides (S^{2-}), sulfites (SO_3^{2-}), phosphates (PO_4^{3-}),	alkali metal ions and NH ₄ ⁺	
hydroxides (OH ⁻) and peroxides (O ₂ ²⁻)	alkali metal ions and NH ₄ ⁺ *Ca ²⁺ , *Sr ²⁺ and Ba ²⁺ (CBS)	

Polyatomic El (Diatom	
hydrogen	H ₂
nitrogen	N ₂
oxygen	O_2
fluorine	F ₂
chlorine	Cl ₂
bromine	Br ₂
iodine	I ₂

Metric I	Prefix	kes
kilo-	k	10^3
deci-	d	10^{-1}
centi-	c	10^{-2}
milli-	m	10^{-3}
micro-	μ	10 ⁻⁶
nano-	n	10-9

8 Strong Acids (H ⁺)		
(all other acids are weak)		
hydrochloric acid	HCl	
hydrobromic acid	HBr	
hydroiodic acid	HI	
perchloric acid	HClO ₄	
hydronium ion	H_3O^+	
nitric acid	HNO ₃	
periodic acid	HlO ₄	
sulfuric acid	H ₂ SO ₄	

8 Strong Bases (OH)		
(all other bases are weak)		
lithium hydroxide	LiOH	
sodium hydroxide	NaOH	
potassium hydroxide	KOH	
rubidium hydroxide	RbOH	
cesium hydroxide	CsOH	
calcium hydroxide	*Ca(OH) ₂	
strontium hydroxide	*Sr(OH) ₂	
barium hydroxide	Ba(OH) ₂	

*Limited solubility