

Table of Some Common Polyatomic Ions

1 – Ions		2 – Ions		3 – Ions	
Formula	Name	Formula	Name	Formula	Name
H ₂ PO ₄ [−]	dihydrogen phosphate	HPO ₄ ^{2−}	hydrogen phosphate	PO ₄ ^{3−}	phosphate
H ₂ PO ₃ [−]	dihydrogen phosphite	HPO ₃ ^{2−}	hydrogen phosphite	PO ₃ ^{3−}	phosphite
HCO ₃ [−]	hydrogen carbonate	CO ₃ ^{2−}	carbonate	BO ₃ ^{3−}	borate
HSO ₄ [−]	hydrogen sulfate	SO ₄ ^{2−}	sulfate		
HSO ₃ [−]	hydrogen sulfite	SO ₃ ^{2−}	sulfite		
BrO ₃ [−]	bromate	C ₂ O ₄ ^{2−}	oxalate		
CH ₃ COO [−]	acetate	CrO ₄ ^{2−}	chromate		
C ₆ H ₅ COO [−]	benzoate	Cr ₂ O ₇ ^{2−}	dichromate		
ClO [−]	hypochlorite	S ₂ O ₃ ^{2−}	thiosulfate		
ClO ₂ [−]	chlorite	SiO ₃ ^{2−}	silicate		
ClO ₃ [−]	chlorate	1 + Ions			
ClO ₄ [−]	perchlorate	Formula		Name	
CN [−]	cyanide				
IO ₃ [−]	iodate				
OH [−]	hydroxide	NH ₄ ⁺	ammonium		
NO ₃ [−]	nitrate	H ₃ O ⁺	hydronium		
NO ₂ [−]	nitrite				
MnO ₄ [−]	permanganate				
SCN [−]	thiocyanate				

Formulae

$q = mc\Delta T$
$q = C\Delta T$
$q = n\Delta H_{\text{mol}}$
$\text{pH} = -\log\left[\text{H}_3\text{O}^+\right]$
$Q = It$
$Q = n_e F$
$\Delta H^\circ_{\text{rxn}} = \Sigma\left(n\Delta H^\circ_{\text{f products}}\right) - \Sigma\left(n\Delta H^\circ_{\text{f reactants}}\right)$
$\Delta H_{\text{rxn}} = \Sigma\text{BE}\left(\text{reactants}\right) - \Sigma\text{BE}\left(\text{products}\right)$
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Constants and Conversions

Quantity	Symbol	Value
Avogadro’s Number	N _A	6.022 × 10 ²³
standard temperature and pressure	STP	0.00 °C and 101.3 kPa
molar volume for a gas @ STP	MV	22.4 L/mol
auto-ionization constant of water @ 25 °C	K _w	1.00 × 10 ^{−14}
enthalpy of fusion for water @ 0 °C	ΔH ^o _{fus}	6.02 kJ/mol
enthalpy of vaporization for water @ 100.0 °C	ΔH ^o _{vap}	40.7 kJ/mol
specific heat of water @ 25.0 °C	c _{water}	4.184 J/g°C
specific heat of ice	c _{ice}	2.03 J/g°C
specific heat of steam	c _{steam}	2.01 J/g°C
Faraday’s Constant	F	96500 C/mol

Solubility Rules for Ionic Compounds in Water at 25 °C

Ions	Group IA, NH ₄ ⁺ , H ⁺ (H ₃ O ⁺)	ClO ₃ [−] , NO ₃ [−] , ClO ₄ [−]	Cl [−] , Br [−] , I [−]	CH ₃ COO [−]	SO ₄ ^{2−}	S ^{2−}	OH [−]	PO ₄ ^{3−} , SO ₃ ^{2−} , CO ₃ ^{2−}
(aq) high Solubility (> 0.1 mol/L)	all	all	most	most	most	Group IA, Group IIA, NH ₄ ⁺	Group IA, NH ₄ ⁺ , Sr ²⁺ , Ba ²⁺ , Tl ⁺	Group IA, NH ₄ ⁺
(s) low Solubility (< 0.1 mol/L)	none	none	Ag ⁺ , Tl ⁺ , Hg ₂ ²⁺ , Hg ⁺ , Cu ⁺ , Pb ²⁺	Ag ⁺ , Hg ⁺	Ca ²⁺ , Sr ²⁺ , Ba ²⁺ , Ra ²⁺ , Pb ²⁺ , Ag ⁺	most	most	most