

CONSTANTS, CONVERSIONS AND EQUATIONS

$$R = 0.08206 \text{ L atm mol}^{-1} \text{ K}^{-1}$$

$$1 \text{ atm} = 760 \text{ torr}$$

STP: 0°C and 1 atm

$$PV = nRT \quad \frac{P_1 V_1}{n_1 R T_1} = \frac{P_2 V_2}{n_2 R T_2}$$

SOLUBILITIES OF IONIC COMPOUNDS IN WATER

Anion	Soluble*	Slightly Soluble*	Insoluble*
NO ₃ ⁻ (nitrate)	All	—	—
CH ₃ COO ⁻ (acetate)	Most	—	Be(CH ₃ COO) ₂
SO ₄ ²⁻ (sulfate)	Most	CaSO ₄ , Ag ₂ SO ₄	BaSO ₄ , PbSO ₄
F ⁻ (fluoride)	Group I, AgF, BeF ₂	SrF ₂ , BaF ₂ , PbF ₂	MgF ₂ , CaF ₂
Cl ⁻ (chloride)	Most	PbCl ₂	AgCl, Hg ₂ Cl ₂
I ⁻ (iodide)	Most	—	AgI, PbI ₂
PO ₄ ³⁻ (phosphate)	Group I, (NH ₄) ₃ PO ₄	—	Most
CO ₃ ²⁻ (carbonate)	Group I, (NH ₄) ₂ CO ₃	—	Most
OH ⁻ (hydroxide)	Group I, Ba(OH) ₂	Sr(OH) ₂ , Ca(OH) ₂	Most

*Soluble: dissolves to the extent of > 10 g/L *Slightly Soluble: 0.1 to 10 g/L *Insoluble: < 0.1 g/L

PERIODIC TABLE

		1A															8A				
		1															2				
		H															He				
		1.008															4.003				
		1A		2A												3A	4A	5A	6A	7A	8A
		3	4											5	6	7	8	9	10		
		Li	Be											B	C	N	O	F	Ne		
		6.941	9.012											10.81	12.01	14.01	16.00	19.00	20.18		
		11	12											13	14	15	16	17	18		
		Na	Mg	3	4	5	6	7	8	9	10	11	12	26.98	28.09	30.97	32.07	35.45	39.95		
2		19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
		K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr		
		39.10	40.08	44.96	47.88	50.94	52.00	54.94	55.85	58.93	58.69	63.55	65.39	69.72	72.61	74.92	78.96	79.90	83.80		
3		37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54		
		Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe		
		85.47	87.62	88.91	91.22	92.91	95.94	(98)	101.1	102.9	106.4	107.9	112.4	114.8	118.7	121.8	127.6	126.9	131.3		
4		55	56	La-Lu	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86		
		Cs	Ba	La-Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn		
		132.9	137.3		178.5	180.9	183.8	186.2	190.2	192.2	195.1	197.0	200.6	204.4	207.2	209.0	(209)	(210)	(222)		
5		87	88	Ac-Lr	104	105	106	107	108	109	110	111	112		114		116		118		
		Fr	Ra	Ac-Lr	Rf	Db	Sg	Bh	Hs	Mt	Uun	Uuu	Uub		Uuq		Uuh		Uuo		
		(223)	(226)		(261)	(262)	(263)	(264)	(265)	(268)	(269)	(272)	(269)								

Lanthanides	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
	138.9	140.1	140.9	144.2	(145)	150.4	152.0	157.2	158.9	162.5	164.9	167.3	168.9	173.0	175.0
Actinides	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103
	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr
	(227)	232.0	231.0	238.0	(237)	(244)	(243)	(247)	(247)	(251)	(252)	(257)	(258)	(259)	(262)