Honors Chemistry
Final Exam Reference Tables

FORMULAS

$c=\lambda\nu$

$PV = nRT$

$$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$$

$q = mc\Delta T$
$q = mH_f$
$q = mH_v$

$$\text{Molarity} = \frac{\text{moles of solute}}{\text{liters of solution}}$$

$$\text{Density} = \frac{\text{mass}}{\text{Volume}}$$

$M_iV_i = M_2V_2$

$pH = -\log [H^+]$
$pOH = -\log [OH^-]$
$pH + pOH = 14$
$K_w = [H^+][OH^-]$

CONSTANTS

speed of light, $c = 3.00 \times 10^8$ m/s

$R = 0.0821$ L atm/K mol
$R = 8.31$ L kPa/K mol

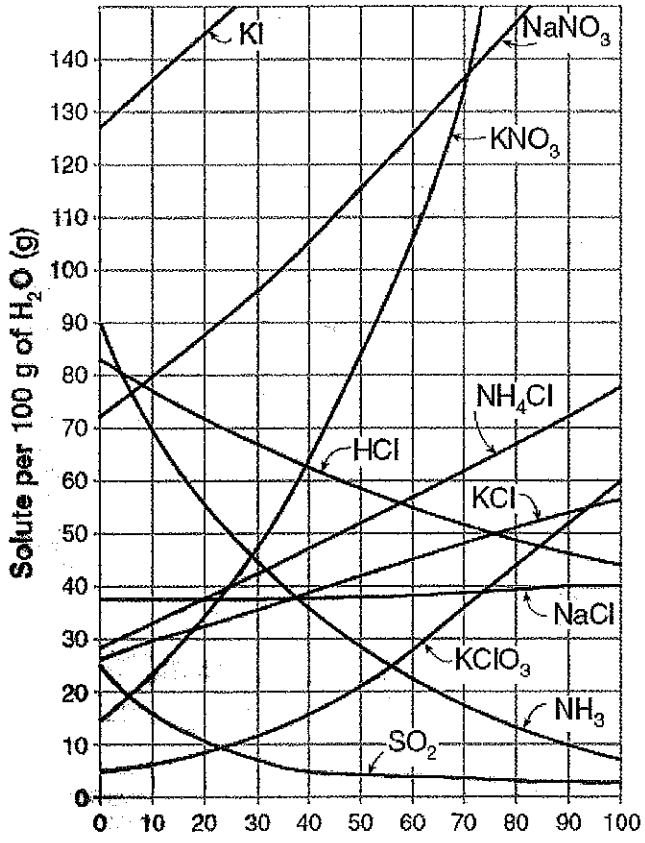
1 atm = 101.3 kPa = 760 torr = 760 mmHg

for water:
specific heat, $c = 4.18$ J/g °C
$H_f = 334$ J/g
$H_v = 2260$ J/g

$K_w = 1 \times 10^{-14}$

Avagadro's number = 6.02×10^{23} particles/mol
Molar gas volume at STP = 22.4 L

Table G Solubility Curves



Simple Rules for the Solubility of Ionic Compounds in Water

1. Most nitrate (NO_3^-) and acetate (CH_3COO^-) salts are soluble
2. Most salts containing the alkali metal cations (Li^+, Na^+, K^+, Rb^+, Cs^+) and the ammonium (NH_4^+) cation are soluble.
3. Most chloride, bromide, and iodide salts are soluble.
   Except those containing Ag^+, Pb^{2+}, and Hg^+.
4. Most sulfate salts are soluble.
   Except those containing Ba^{2+}, Pb^{2+}, Hg^{2+}, Sr^{2+}, and Ca^{2+}.
5. Most hydroxide salts are insoluble except those of the alkali metal cations and a few alkaline earth metals:
   Ba^{2+}, Sr^{2+}, and Ca^{2+}.
6. Most sulfide (S^{2-}), carbonate (CO_3^{2-}), chromate (CrO_4^{2-}), and phosphate (PO_4^{3-}) salts are insoluble except those of the alkali metal cations and the ammonium (NH_4^+) cation

Honors Chemistry
Final Exam Reference Tables

1																	2
H Hydrogen 1.00794																	He Helium 4.003
3	4											5	6	7	8	9	10
Li Lithium 6.941	Be Beryllium 9.012182											B Boron 10.811	C Carbon 12.0107	N Nitrogen 14.00674	O Oxygen 15.9994	F Fluorine 18.9984032	Ne Neon 20.1797
11	12											13	14	15	16	17	18
Na Sodium 22.989770	Mg Magnesium 24.3050											Al Aluminum 26.981538	Si Silicon 28.0855	P Phosphorus 30.973761	S Sulfur 32.066	Cl Chlorine 35.4527	Ar Argon 39.948
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
K Potassium 39.0983	Ca Calcium 40.078	Sc Scandium 44.955910	Ti Titanium 47.867	V Vanadium 50.9415	Cr Chromium 51.9961	Mn Manganese 54.938049	Fe Iron 55.845	Co Cobalt 58.933200	Ni Nickel 58.6934	Cu Copper 63.546	Zn Zinc 65.39	Ga Gallium 69.723	Ge Germanium 72.61	As Arsenic 74.92160	Se Selenium 78.96	Br Bromine 79.904	Kr Krypton 83.80
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Rb Rubidium 85.4678	Sr Strontium 87.62	Y Yttrium 88.90555	Zr Zirconium 91.224	Nb Niobium 92.90638	Mo Molybdenum 95.94	Tc Technetium (98)	Ru Ruthenium 101.07	Rh Rhodium 102.90550	Pd Palladium 106.42	Ag Silver 107.8682	Cd Cadmium 112.411	In Indium 114.818	Sn Tin 118.710	Sb Antimony 121.760	Te Tellurium 127.60	I Iodine 126.90447	Xe Xenon 131.29
55	56	57	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
Cs Cesium 132.90545	Ba Barium 137.327	La Lanthanum 138.9055	Hf Hafnium 178.49	Ta Tantalum 180.9479	W Tungsten 183.84	Re Rhenium 186.207	Os Osmium 190.23	Ir Iridium 192.217	Pt Platinum 195.078	Au Gold 196.96655	Hg Mercury 200.59	Tl Thallium 204.3833	Pb Lead 207.2	Bi Bismuth 208.98038	Po Polonium (209)	At Astatine (210)	Rn Radon (222)
87	88	89	104	105	106	107	108	109	110	111	112	113	114				
Fr Francium (223)	Ra Radium (226)	Ac Actinium (227)	Rf Rutherfordium (261)	Db Dubnium (262)	Sg Seaborgium (263)	Bh Bohrium (262)	Hs Hassium (265)	Mt Meitnerium (266)	(269)	(272)	(277)						

58	59	60	61	62	63	64	65	66	67	68	69	70	71
Ce Cerium 140.116	Pr Praseodymium 140.90765	Nd Neodymium 144.24	Pm Promethium (145)	Sm Samarium 150.36	Eu Europium 151.964	Gd Gadolinium 157.25	Tb Terbium 158.92534	Dy Dysprosium 162.50	Ho Holmium 164.93032	Er Erbium 167.26	Tm Thulium 168.93421	Yb Ytterbium 173.04	Lu Lutetium 174.967
90	91	92	93	94	95	96	97	98	99	100	101	102	103
Th Thorium 232.0381	Pa Protactinium 231.03588	U Uranium 238.0289	Np Neptunium (237)	Pu Plutonium (244)	Am Americium (243)	Cm Curium (247)	Bk Berkelium (247)	Cf Californium (251)	Es Einsteinium (252)	Fm Fermium (257)	Md Mendelevium (258)	No Nobelium (259)	Lr Lawrencium (262)

Selected Polyatomic Ions

Formula	Name
H_3O^+	hydronium
Hg_2^{2+}	mercury(I)
NH_4^+	ammonium
$C_2H_3O_2^-$ / CH_3COO^-	acetate
CN^-	cyanide
CO_3^{2-}	carbonate
HCO_3^-	hydrogen carbonate
$C_2O_4^{2-}$	oxalate
ClO^-	hypochlorite
ClO_2^-	chlorite
ClO_3^-	chlorate
ClO_4^-	perchlorate
CrO_4^{2-}	chromate
$Cr_2O_7^{2-}$	dichromate
MnO_4^-	permanganate
NO_2^-	nitrite
NO_3^-	nitrate
O_2^{2-}	peroxide
OH^-	hydroxide
PO_4^{3-}	phosphate
SCN^-	thiocyanate
SO_3^{2-}	sulfite
SO_4^{2-}	sulfate
HSO_4^-	hydrogen sulfate
$S_2O_3^{2-}$	thiosulfate