CHEMISTRY I EQUATION SHEET

Solubility Rules

Negative Ion	Plus	Positive Ion	Form a Compound which is
Any neg. ion	+	group 1a ions	Soluble
Any neg. ion	+	Ammonium ion	Soluble
Nitrate	+	any positive ion	Soluble
Acetate	+	any positive ion except Ag^{+} or Hg^{2+}	Soluble
Chloride, bromide or iodide	+	Ag^{+},Pb^{2+},Hg^{+} or Cu^{+}	Not Soluble
	+	Any other positive ion	Soluble
Sulfate	+	Ca^{2+},Sr^{2+},Ba^{2+}, Ra^{2+},Ag^{+}or Pb^{2+}	Not Soluble
	+	Any other positive ion	Soluble
Sulfide	+	group 1a ions or ammonium	Soluble
	+	Be^{2+},Mg^{2+},Ca^{2+}, Sr^{2+},Ba^{2+}or Ra^{2+}	Soluble
	+	Any other positive ion	Not Soluble
Hydroxide	+	group 1a ions or ammonium	Soluble
	+	Any other positive ion	Not Soluble
Carbonate, Chromate, Phosphate, or Sulfite	+	group 1a ions or ammonium	Soluble
	+	Any other positive ion	Not Soluble

Polyatomic Ions

Name	Formula
Ammonium	NH_4^{+1}
Acetate	$C_2H_3O_2^{-1}$
Carbonate	CO_3^{-2}
Bicarbonate or Hydrogen carbonate	HCO_3^{-1}
Hypochlorite	ClO^{-1}
Chlorite	ClO_2^{-1}
Chlorate	ClO_3^{-1}
Perchlorate	ClO_4^{-1}
Hydroxide	OH^{-1}
Cyanide	CN^{-1}
Nitrate	NO_3^{-1}
Nitrite	NO_2^{-1}
Chromate	CrO_4^{-2}
Oxalate	$C_2O_4^{-2}$
Sulfate	SO_4^{-2}
Sulfite	SO_3^{-2}
Hydrogen sulfate	HSO_4^{-1}
Phosphate	PO_4^{-3}
Phosphite	PO_3^{-3}
Hydrogen phosphate	HPO_4^{-2}

Equations

D = m/v

Molarity = $\frac{mol}{V}$

$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$

$Q = mc\,\Delta T$

$PV = nRT$

$F = I\,(1/2)^{n}$

$n = \frac{\text{Total Time}}{\text{Half Life Time}}$

c = specific heat
d = density
I = initial amount
F= final amount
m = mass
M = molarity
n = number of moles & number of half lives
P = pressure
R = ideal gas constant
Q = heat energy
T = temperature
V = volume
X =amount of matter left

Activity Series in Decreasing Activity

Metals
Lithium
Rubidium
Potassium
Calcium
Sodium
Magnesium
Aluminum
Manganese
Zinc
Iron
Nickel
Tin
Lead
Hydrogen
Copper
Silver
Platinum
Gold
Nonmetals
Fluorine
Chlorine
Bromine
iodine

Metric Conversions

Unit	Abbr.	Meaning
Mega-	M	10^{6}
kilo-	k	10^{3}
hecto-	h	10^{2}
deca-	dk	10^{1}
Liter	L	1
gram	g	1
meter	m	1
deci-	d	10^{-1}
centi-	c	10^{-2}
milli-	m	10^{-3}
micro-	μ	10^{-6}
nano-	n	10^{-9}

Constants

Pressure	1 atm = 103.7 kPa
	1 atm = 760 mm Hg
Universal Gas Constant	R = 8.314 L x kPa / mol°C
	or 0.0821 L x atm / mol°C
Avogadro's number	6.02 X 10^{23} particles
Specific Heats (J / g°C)	Water = 4.180
	Aluminum = 0.895
	Copper = 0.387
	Iron = 0.448

Calorie Coversions

Water = 1 cal/ g°C

1000 cal = 1 Cal