

Single Bonds (in kJ mol <sup>-1</sup> )												
	H	C	N	O	S	F	Cl	Br	I	B	Si	As
H	432											
C	411	346										
N	386	305	167									
O	459	358	201	142								
S	363	272		265	226							
F	565	485	283	190	284	155						
Cl	428	327	313	218	255	249	240					
Br	362	285	163	201	217	249	216	190				
I	295	213		201		278	208	175	149			
B	389	356		536		613	456	410		293		
Si	318	301		453	293	565	381	310	234		222	
As	247			301		484	322	458	200			146
Multiple Bonds (in kJ mol <sup>-1</sup> )												
C=C	602			C≡C	835			N=N	418		S=S	425
C=N	615			C≡N	887			N=O	607		P=O	544
C=O	745	799 in CO <sub>2</sub>		C=O	1072			O=O	494		P=S	335
C=S	573			N≡N	942			S=O	532			

#### Some Useful Constants

Avogadro Constant, $N_A$	$6.0221 \times 10^{23} \text{ mol}^{-1}$
Gas Constant, $R$	$8.3144 \text{ J mol}^{-1} \text{ K}^{-1}$
	$0.082057 \text{ L atm mol}^{-1} \text{ K}^{-1}$
	$62.364 \text{ L torr mol}^{-1} \text{ K}^{-1}$
Molar Volume of an Ideal Gas, $V_m$	$22.414 \text{ L mol}^{-1}$
Speed of Light, $c$	$299\,792\,458 \text{ m s}^{-1}$ (exact)
Planck Constant, $h$	$6.6261 \times 10^{-34} \text{ J s}$
Rydberg Constant, $R_H$	$2.1798 \times 10^{-18} \text{ J}$
Faraday Constant, $F$	$96\,485 \text{ C mol}^{-1}$
Mass of the electron, $m_e$	$9.1094 \times 10^{-31} \text{ kg}$
Specific Heat of liquid water, $s_l$	$4.184 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$
Specific Heat of solid water, $s_s$	$2.059 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$
Specific Heat of water vapor, $s_g$	$2.025 \text{ J g}^{-1} \text{ }^\circ\text{C}^{-1}$
Heat of vaporization of water, $\Delta H_v$	$44.0 \text{ kJ mol}^{-1}$
Heat of fusion of water, $\Delta H_f$	$6.01 \text{ kJ mol}^{-1}$

#### Solubility Rules

Salts which are soluble:

1. All salts containing Group IA ions.
2. All salts containing Ammonium ion
3. All salts containing Nitrate ions

Salts which are generally soluble with some exceptions:

1. All salts containing Acetate ions except with Silver and Mercury(I).
2. All Chlorides, Bromides, and Iodides are soluble except with Silver, Lead(II), and Mercury(I).
3. All Sulfates are soluble except with Silver, Lead(II), Mercury(I), Calcium, Strontium, and Barium.

Salts which are generally insoluble with some exceptions:

1. All Hydroxides are insoluble except with Group IA ions, Calcium, Strontium, and Barium.
2. All Carbonates, Phosphates, and Sulfides are insoluble except with Group IA and Ammonium ions.