

# 7 • How Do Atoms Stick Together?

## ELECTRONEGATIVITY

Electronegativity Values,  $X$ , (by Linus Pauling):

1 H 2.1																				
3 Li 1.0	4 Be 1.5															5 B 2.0	6 C 2.5	7 N 3.0	8 O 3.5	9 F 4.0
11 Na 1.0	12 Mg 1.2															13 Al 1.5	14 Si 1.8	15 P 2.1	16 S 2.5	17 Cl 3.0
19 K 0.9	20 Ca 1.0	21 Sc 1.3	22 Ti 1.4	23 V 1.5	24 Cr 1.6	25 Mn 1.6	26 Fe 1.7	27 Co 1.7	28 Ni 1.8	29 Cu 1.8	30 Zn 1.6	31 Ga 1.7	32 Ge 1.9	33 As 2.1	34 Se 2.4	35 Br 2.8				
37 Rb 0.9	38 Sr 1.0	39 Y 1.2	40 Zr 1.3	41 Nb 1.5	42 Mo 1.6	43 Tc 1.7	44 Ru 1.8	45 Rh 1.8	46 Pd 1.8	47 Ag 1.6	48 Cd 1.6	49 In 1.6	50 Sn 1.8	51 Sb 1.9	52 Te 2.1	53 I 2.5				
55 Cs 0.8	56 Ba 1.0	57 La 1.1	72 Hf 1.3	73 Ta 1.4	74 W 1.5	75 Re 1.7	76 Os 1.9	77 Ir 1.9	78 Pt 1.8	79 Au 1.9	80 Hg 1.7	81 Tl 1.6	82 Pb 1.7	83 Bi 1.8	84 Po 1.9	85 At 2.1				
87 Fr 0.8	88 Ra 1.0	89 Ac 1.1																		

Each atom is assigned a value that represents how much it attracts electrons. One family is missing from this chart: \_\_\_\_\_. These do not usually form bonds and have undefined electronegativity values.

For any pair of atoms, you should state whether the two atoms:

share electrons equally	share electrons unequally	transfer electrons
<b>nonpolar covalent bond</b>	<b>polar covalent bond</b>	<b>ionic bond</b>
$\Delta X < .5$	$.5 \leq \Delta X \leq 1.7$	$\Delta X > 1.7$
A – B	$A^{\delta+} - B^{\delta-}$	$A^+ - B^-$

	Molecule	$X$	$X$	$\Delta X$	Bond Type	Notation
Ex	PCl <sub>3</sub>	P = 2.1	Cl = 3.0	.9	polar covalent	$P^{\delta+} - Cl^{\delta-}$
1.	CH <sub>4</sub>	C =	H =			C – H
2.	NaCl	Na =	Cl =			Na – Cl
3.	PH <sub>3</sub>	P =	H =			P – H
4.	NO <sub>2</sub>	N =	O =			N – O
5.	CaO	Ca =	O =			Ca – O
6.	H <sub>2</sub> O	H =	O =			H – O
7.	KF	K =	F =			K – F
8.	Cl <sub>2</sub>	Cl =	Cl =			Cl – Cl
9.	CO <sub>2</sub>	C =	O =			C – O