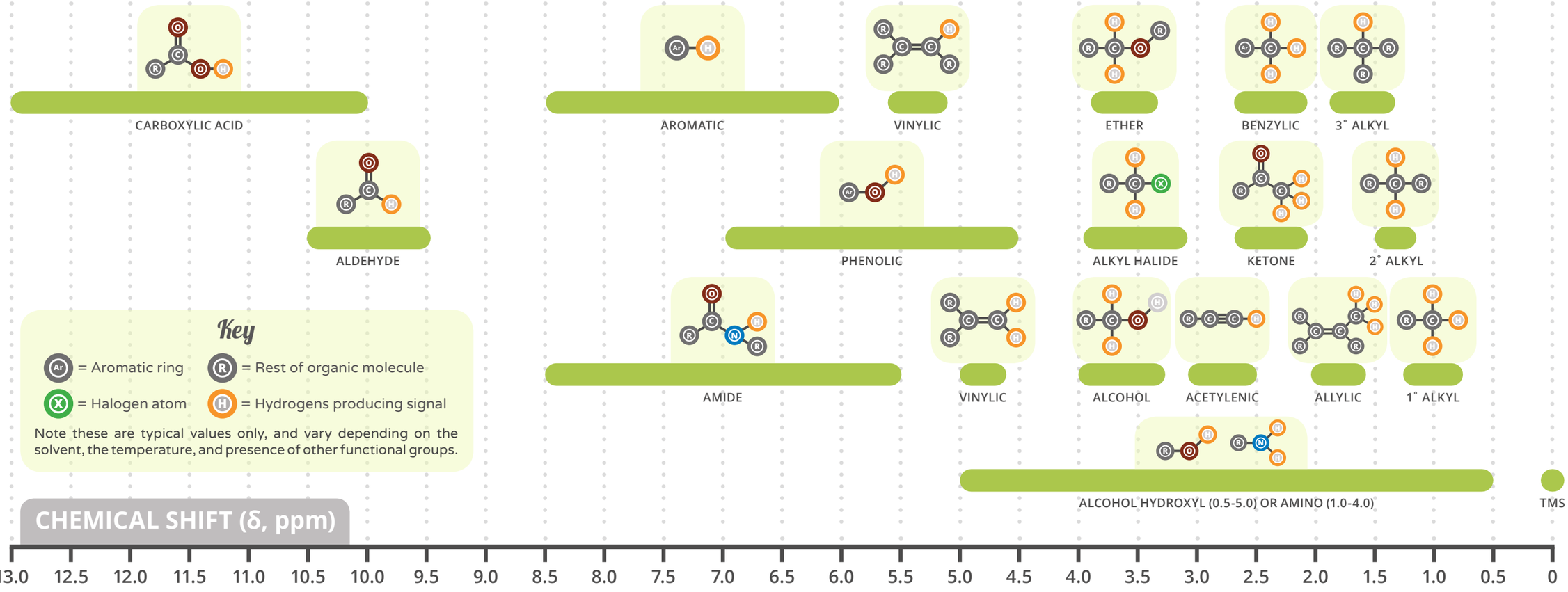
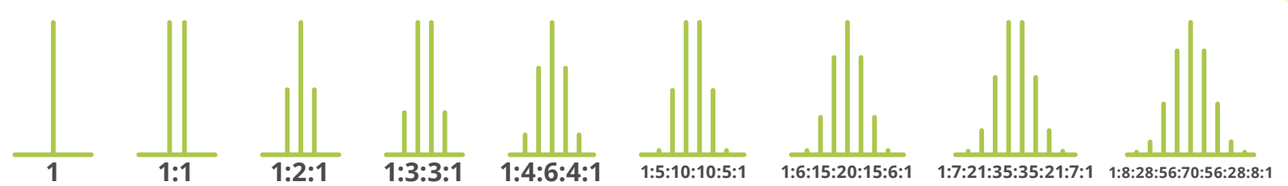
A GUIDE TO ^{1}H NMR CHEMICAL SHIFT VALUES

Nuclear Magnetic Resonance (NMR) is a commonly used technique for organic compound structure determination. In ^{1}H NMR, applying an external magnetic field causes the nuclei spin to flip. The environment of the proton in the molecule affects where the signal is seen on the resultant spectrum.



SPIN-SPIN COUPLING PATTERNS IN NMR SPECTRA

Hydrogen nuclei themselves possess a small magnetic field, and can influence the signal seen for hydrogens on neighbouring carbon atoms. This is known as spin-spin coupling. The number of signals the original signal is split into is equal to the number of hydrogens on neighbouring carbon atoms plus one, according to the patterns shown to the left. The area underneath the peaks indicates the number of hydrogen atoms responsible for each signal.



1	1:1	1:2:1	1:3:3:1	1:4:6:4:1	1:5:10:10:5:1	1:6:15:20:15:6:1	1:7:21:35:35:21:7:1	1:8:28:56:70:56:28:8:1
SINGLET	DOUBLET	TRIPLET	QUARTET	QUINTET	SEXTET	SEPTET	OCTET	NONET
0 adj H	1 adj H	2 adj H	3 adj H	4 adj H	5 adj H	6 adj H	7 adj H	8 adj H

NUMBER OF HYDROGENS ON ADJACENT CARBON ATOMS