CHEM 109A

Organic Chemistry

https://labs.chem.ucsb.edu/zakarian/armen/courses.html

Chapter 1 Electronic Structure and Bonding





















































































Hybridization, Bond Angle, Bond Length, Bond Strength						
Table 1.7 Comp	parison of the Bond Angle	s and the Lengths and	d Strengths of the Carbo	n–Carbon and Carbon–I	Hydrogen Bonds in Ethan	e, Ethene, and Ethyne
Molecule	Hybridization of carbon	Bond angles	Length of C-C bond (Å)	Strength of C — C bond (kcal/mol)	Length of C—H bond (Å)	Strength of C—H bond (kcal/mol)
H H H H H H H H H H H H H	sp ³	109.5°	1.54	90.2	1.10	101.1
H H H H H H	sp ²	120°	1.33	174.5	1.08	110.7
H−C≡C−H ethyne	sp	180°	1.20	230.4	1.06	133.3

Summary

- The shorter the bond, the stronger it is.
- The greater the electron density in the region of
- orbital overlap, the stronger the bond.
- The more *s* character, the shorter and stronger the bond.
- The more *s* character, the larger the bond angle.







